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# CELSciTech - 2018

on Communication, economics, education, law, science and technology

## Conference Proceedings

### INTERNATIONAL CONFERENCE

#### “CELSciTech towards Downstream and Commercialization of Research”

Pekanbaru, September 20th, 2018



Universitas Muhammadiyah Riau

Volume: 3 / September 2018

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# CELSciTech

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## FOREWORD BY THE RECTOR OF UMRI

Assalamu'alaikum Wr. Wb. Greetings to everyone here today, may Allah Almighty always bestow His grace and blessings upon all of us. First of all, I would like to welcome the speakers and participants of the International Conference on CELSciTech (communication, economics, education, law, science and technology) who have come from several countries, namely Indonesia, Canada, Malaysia, Australia and Singapore. This conference is a means of communication and sharing for researchers from universities, educational institutions, research institutions and industry to accelerate scientific development in the fields of communication, economics, education, law, science and technology. It has the potential to be a truly beneficial endeavor for us all. Hopefully, a lot of helpful innovations, insights, or discoveries could emerge as a result of this conference.

Now, I'm sure we all can agree that scientific development is a monumentally crucial driving force for the progress and growth of our civilization. Scientific development is expected to almost certainly improve and increase the prosperity of our society. One path to take, in order to maximize the capacity of scientific development in improving the prosperity of our society, is to carry out more research that focuses on downstream which aims to provide and produce more economically viable and valuable results. The Minister of Research, Technology and Higher Education, Mohamad Nasir, refers to this as, "towards Downstream and Commercialization of Research." As a response to this particular idea, Universitas Muhammadiyah is conducting the International Conference on 4 topics, namely Economics and Business, Education and Teaching, Science and Technology, and Social Sciences and Humanities Communication, Economic, Education, Law, Social Humanities, Science and Technology. Through this CELSciTech 2018, UMRI initiates a forum in the form of scientific discussions from various disciplines which are present and participating within this conference. Being able to organize such an important and significant event as this, provides us here at UMRI, with an immeasurable sense of pride and encouragement. Taking these steps is a huge step forward for UMRI in its journey to become a truly impactful institution in the world of academia, and in contributing to the development of potential intellectuals of the future.

There are a number of different actors involved in the success of this event. Without their cooperation and dedication, the organization of this event would have not been possible. Therefore, it is imperative that gratitude is expressed where it's due. Therefore, on this occasion, UMRI would like to express its utmost gratitude to the Institute for Research and Community Service of UMRI, CELSciTech Committee, speakers and conference participants as well as all parties who support this event. Your contributions are unquestionably valuable, and they are deeply appreciated. Finally, we would like wish you all good luck, and we hope to see you next year at CELSciTech 2019.

Pekanbaru, September 20 th, 2018  
Rector of Universitas Muhammadiyah Riau

**Dr. H. Mubarak,M.Si**

## FOREWORD BY THE CHAIR

Assalamu'alaikum Wr Wb

I want to welcome to Pekanbaru and UMRI

- # The honorable Chairman of higher education, research and development of PP Muhammadiyah
- # The honorable Pengurus Wilayah Muhammadiyah Riau
- # The honorable Badan Pembina Harian Muhammadiyah University of Riau
- # The honorable Rector of Muhammadiyah University of Riau
- # The honorable Vice Rectors of Muhammadiyah University of Riau
- # The honorable of All Deans at Muhammadiyah University of Riau
- # and all invited guests I'm proud of.

First of all, let's give thanks to Allah SWT, who gives us strength, determination, and good health for us to attend this conference. On behalf of the CELSciTech 2018 Committee, I am very pleased and honored to welcome the speakers and participants of this CELSciTech international conference.

The conference is organized by the Institute for Research and Community Service of Muhammadiyah University of Riau (UMRI) which coincided with a decade of UMRI. CELSciTech is a very unique conference because it covers a very broad research area. This conference is held annually by UMRI as an information sharing forum that focuses on various issues. This conference presents 4 topics, namely Economics and Business, Education and Teaching, Science and Technology, and Social Sciences and Humanities. In addition, there are also several sub-topics that the speakers can choose to present their papers. CELSciTech is primarily designed to be a forum for researchers to disseminate and discuss research results. The main theme of this year's conference is CELSciTech towards Downstream and Commercialization of Research.

At this international conference, 81 papers were presented. This paper comes from various countries author and co-author, namely Indonesia, Canada, Malaysia, Australia and Singapore. On this occasion I introduced three main speakers to present the material at this conference, namely Prof. Lincoln Arsyad, Ph.D from Gadjah Mada University-Indonesia, with a background in Economic. Dr. Syafiqah Saidin from Universiti Teknologi Malaysia, with a background in Biomedical Engineering. And Associate. Prof. M. Akbar Rhamdhani from Swinburne Technology University Australia, with a background in Materials Engineering. The three speakers will enlighten our understanding of technological and research developments in Indonesia.

Special appreciation goes to the Rector of UMRI, Vice Rectors, and staffs who have contributed ideas and time to support this conference. I would also like to thank all the fellow committee members, who have worked hard for almost a year to prepare and realize this

conference. I hope that the entire program will serve as a forum to enrich the research results of the speakers, fostering new ideas for further research and expanding networks with new colleagues. I hope the speakers will have sweet memories from this conference, UMRI, and Pekanbaru. Special thanks to all speakers who have spent their working time to produce new papers to be presented at this conference.

Wassalamu'alaikum Wr wb  
Chair of the CELSciTech 2018

**Ir. Ahmad Kafrawi Nasution, MT, Ph.D, IPP**

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**KEYNOTE  
ABSTRACTS**

## Solar Silicon Production from Metallurgical Grade Silicon

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**Abstract.** Silicon is used in solar photovoltaic cell application. With the increase of the usage of PV cell around the world, it is vital to manage the supply and demand of the raw materials for the production of silicon suitable for the application. This presentation will discuss the current industrial process to produce silicon appropriate for the PV cell application. There is an alternative for producing solar grade silicon from alternative source of metallurgical grade silicon. Different approach for refining the metallurgical grade silicon, such as slag refining, volatilization, selective boron (B) oxidation, electron beam melting, plasma purification, alloying and directional solidification will be discussed as well. Recently, the author and co-workers have developed a unique approach to remove impurities (particularly B) from the silicon using electrically-enhanced slag reaction. In this approach, an external potential difference across the metal and slag is applied and this results in the increase of the mass transfer of B into the slag, as well as the increase of the capacity of which the slag can absorb the B. Effectively, the applied potential result in the increase the overall kinetic and shift in equilibrium. In our work, the CaO-SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> based slag was used in the study. The application of up to 5 V difference resulted in the increase of the mass transfer kinetics of B (80% faster) and shifting the equilibrium that allow more B to be absorbed by the slag (B partitioning to the slag was increased by 70%). This has provided a promising and alternative approach to improve the quality of the metallurgical grade silicon

## Materials in Medical Application: Cell Accommodation and Antibacterial

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**Abstract.** Biomaterials are any substance, other than drugs, which used to treat, augment or replace dysfunction tissues, organs or functions of the human body. Demands of biomaterial's utilisation are increasing year by year, to address medical complications such as local infection, slow healing and cell retardation. This presentation aims to expose the participants on the selection and types of materials that have ability to comply biomaterial's specification for either cell accommodation or antibacterial purpose. Selection of biomaterial is depends on its medical application and physiological area of restoration. Restorations in the bone, either as a scaffold, cement, prosthesis, implants, etc, require at least bioactive property. Hydroxyapatite, calcium phosphate and titanium are among common used biomaterials for bone application as they are able to induce osteoblast adhesion and proliferation. While, restorations in the blood vessel require at least flexibility and biocompatibility properties. Our research group is utilising several derivations of poly(lactic acid) and poly(glycolic acid) such as PLA, PLGA, PLLA and PDLA, that have been approved by Food and Drug Administration (FDA) to fabricate polymeric stent, degradable coating and hydrogel patch. Infection and inflammation are another issues which raised after implant restoration. We addressed this issue by incorporating antibacterial agents of chlorhexidine, silver, polyaniline and local herbs/plants (*Acalypha indica*, honey) to retard bacterial growth. However, high percentage of antibacterial agent has caused cell toxicity. Determining the composition of antibacterial agents is crucial to accommodate antibacterial effect while preventing cell retardation.

# **ECONOMICS & BUSINESS**

# Fundamental indicators analysis toward foreign exchange (forex) prediction using neural network method-radial basis function (NN-RBF)

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**Abstract.** Phenomenon in forex shows that trading in the forex market was generally just assumed in making decisions buy or sell, so it takes the principle of caution for trading, therefore this study aimed to provide information to traders about the methods used in making predictions buy or sell value of forex (EUR/USD), by using fundamental data that provide information in the form of news. The results of this study indicated that by using the method NN-RBF was able to give recommendation to trader, if MSE close to zero then performance of NN-RBF program run well, for that this program can be used in predict price trend formed so that it can be used as tool and base for decision maker to do buy or sell. It was proved by the NN-RBF program performance of predictable news that shows the results of MSE news Average Hourly Earning ( $1,72 \times 10^{-7}$ ), Consumer Confidence (35,7), CPI ( $6,04 \times 10^{-7}$ ), GDP ( $9,80 \times 10^{-5}$ ), Manufacturing Index (3,660), Non-Farm Employment Change (1,21), and Retail Sales ( $1,55 \times 10^{-7}$ ). The results of this research provided a solution for traders to use the NN-RBF method in predicting the forex in order to know the price at the forex market and prediction accurately.

**Keywords –** *Forex, Neural Network – Radial Basis Function, Trader*

## 1. Introduction

Now a day is technological era, shows that trade transactions no longer will not be done conventionally. The development of era. A long with development a rapidly growing technology making trade transactions can be done without having face to face between the seller and the buyer.

The advancement of the time requires people transact or invest their money to prepare for the future one of them through trading forex. Forex (Foreign Exchange) otherwise known as foreign exchange (Valas) is the trade value of foreign currencies of various countries, where the currency plays a very important role in the continuity of foreign trade and business. There are many currencies traded in the forex market, but researchers only use the EUR/USD currency, because the EUR currency is the single currency used by European Union countries and the USD currency is the currency of the United States and the global currency, where this currency is a currency that can be used as a means of payment around the world.

Previously Forex is merely a mechanism for the payment of inter-state trade transactions, but now it becomes a trade commodity for speculative purposes [1]. Fundamental data used in the form of news



supported by the efficient market theory proposed by Fama states that news can provide information about the formation of prices in the market.

Previous research conducted by Masahiro et al, did fundamental data analysis on the forex market in the form of news after the reform in London in 2015 turned out to have an impact on trading behaviour in the forex market [2], but this research does not use the NN-RBF method. In relation to forex, other researchers done by Trilok et al, explain that making predictions in the forex market can use several methods, one of them is NN-RBF, this research is more focused in the informatics field. And provided to analysis fundamental data from economic side [3]. In line with efficient market theory, this research focuses on the method use Neural Network – Radial Basis Function (NN – RBF) in predicting the exchange rate in order to known that price formed in the foreign exchange market with can predicted accurately, a basis for decision making to buy or sell.

## 2. Review of Literature

Predict the value of forex news, can use the fundamental data contained in one of the forex site is forex factory. Fundamental analysis is an approach that is to analyze or observe and refer to the indicators or many factors that become a country's problems that resulted in the ups and downs of the country's currency such as political factors, financial, economic and even psychological market factors [4]. Any good news that deals directly or indirectly with the economy can be an important fundamental factor to be observed. These broad and complex fundamental factors can be grouped into four broad categories [5] namely economic factors, political factors, financial factors, and external factors. Macroeconomics is one of the branches of economics that discusses aggregate economic behaviour, including prosperity and recession, output of goods and services, total economy, output growth rate, inflation rate and unemployment, balance of payments and also exchange rate [6].

The foreign exchange market, or known as Forex (foreign exchange) is the largest financial exchange in the world with volume daily transactions reached more than 2 trillion US dollars. Total transaction Forex more than 3 times more than all other trade transactions on earth. In other words transaction Forex is the greatest deal [7]. Forex trade meaningful money Forex is a sale and purchase transaction of one type of currency with another currency.

The basic principle of forex trading, same as all types of trades. Buy when the price is low and resale once the price rises. This applies to gold, real-estate, land, anthurium, and rice. Figures 1 and 2 are general principles in making investments and trades and intermediaries between traders and banks [8].



**Figure 1.** General principles of investment and trade



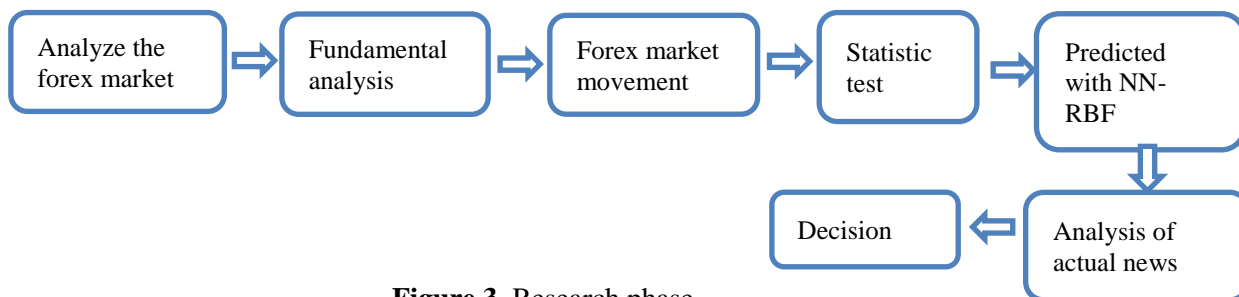
**Figure 2.** Intermediary between trader and bank

Many methods can be done in prediction in the forex market one of them Research conducted by Trilok et al, gives the result that in making predictions in the forex market can use several methods one of them is NN-RBF.

## 3. Method

The first stage of this research is data collection, where the data obtained are: Site website [www.forexfactory.com](http://www.forexfactory.com) After the data fundamental taken then the system on the run and conducted a need analysis of data input system so the predictions that can be used.

The outline of the stages of this study using NN-RBF as follows:

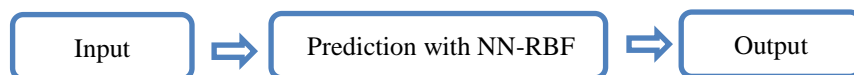


**Figure 3.** Research phase

To know a news has an effect on the value of foreign exchange, can use a correlation test where in the correlation test there is an interval or ratio scale. Below are guidelines to provide interpretation and analysis for correlation coefficient according to Sugiyono [9]:

**Table 1.** Correlation coefficient analysis

Correlation	Information
0,00 – 0,199	Very Low
0,20 – 0,3999	Low
0,40 – 0,5999	Medium
0,60 – 0,799	Strong
0,80 – 1,000	Very Strong



**Figure 4.** Prediction process with NN-RBF

The fundamental data included in the NN-RBF method, then using the existing tools in matlab is RBFN so produce the predicted results. To know the prediction with the NN-RBF method well, then used the formula:

$$MSE = \frac{\sum_{t=1}^n (X_t - F_t)^2}{n}$$

**Information**

*X<sub>t</sub>* = Actual data for a given period  
*F<sub>t</sub>* = Forecasting value in period *t*  
*n* = Number of Data

**4. Result and Discussion**

After performing statistical tests on the news contained in the forex factory, then there are 7 news that have good statistical test results include correlation test where closer to the number 1 means the more true value of the data and test the significance where if the number is 0.00 - 0,05 then the data is significant, as table 1 below.

**Table 2.** Correlation test and significance test

News	Correlation Test	Significant Test
Average Hourly Earning	0,515	0,004
CB Consumer Confidence	0,978	0,000
Consumer Price Index	0,760	0,000
Gross Domestic Product	0,974	0,000
Manufacturing Index	0,685	0,000
Non-Farm Employment Change	0,882	0,000

Retail Sales	0,756	0,000
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The result of this statistic test is supported by the mean score error test result which is closer to the number 0 using the NN-RBF method, the better the performance of the program is shown in table 3 as follows:

**Table 3.** Result MSE NN-RBF

News	MSE
Average Hourly Earning	$1,72.10^{-7}$
CB Consumer Confidence	35,70063
Consumer Price Index	$6,04.10^{-7}$
Gross Domestic Product	$3,65.10^{-7}$
Manufacturing Index	3,660
Non-Farm Employment Change	1,21000
Retail Sales	$1,55.10^{-7}$

The results of the use of forex factory prediction method without any use of NN-RBF method, then the results of the MSE can be seen in table 4 below:

**Table 4.** Result MSE forex factory

Berita	MSE
Average Hourly Earning	$3,314.10^{-5}$
CB Consumer Confidence	4,25455
Consumer Price Index	$7,44828.10^{-6}$
Gross Domestic Product	$1,93546.10^{-5}$
Manufacturing Index	7,62711
Non-Farm Employment Change	5651,8
Retail Sales	$6,40152.10^{-5}$

The results of this study are supported by efficient market theory ie stock prices reflect all available information [10], where

#### 4.1 Average Hourly Earning

Average hourly earning has value *pearson correlation* or positively related 0,515 (table 1) with a significant level of 0.004, indicating that the news has an effect on the foreign exchange rate, and has a value of MSE  $1.72.10^{-7}$  (table 2) indicating that the NN-RBF method is well used in conducting prediction on average hourly earnings news compared before using NN - RBF method has MSE  $3,314.10^{-5}$  (table 3).

#### 4.2 CB Consumer Confidence

CB Consumer Confidence has value *pearson correlation* or positive relation 0.978 (table 1) with a significant level of 0,000, indicating that the news has an effect on foreign exchange rates, and has MSE 35.70063 (table 2) indicating that the NN - RBF method is good for predicting CB consumer confidence report compared before using NN method - RBF has MSE value 4.25455 (table 3).

#### 4.3 Consumer Price Index

Consumer price index has value *pearson correlation* or positive relation 0.760 (table 1) with a significant level of 0,000, indicating that the news has an effect on the foreign exchange rate, and has MSE  $6.04.10^{-7}$  (table 2) indicating that the NN-RBF method is well used in doing prediction of consumer price index news compared before using NN method - RBF has MSE value  $7,44828.10^{-6}$  (table 3).

#### 4.4 Gross Domestic Product

Gross Domestic Product has value *pearson correlation* or positive relation 0.974 (table 1) with a significant level of 0,000, indicating that the news has an effect on the foreign exchange rate, and has MSE value 3.65.10-7 (table 2) indicating that the NN-RBF method is well used in doing prediction of the gross domestic product news compared before using the NN - RBF method has MSE 1,93546.10-5 (table 3).

#### 4.5 Manufacturing Index

Manufacturing Index has value *pearson correlation* or positive relation 0.685 (table 1) with a significant level of 0,000, indicating that the news has an effect on the foreign exchange rate, and has MSE 3,660 (table 2) indicating that the NN - RBF method is good for predicting the manufacturing news index compared before using the NN method - RBF has MSE value of 7.62711 (table 3).

#### 4.6 Non – Farm Employment Change

Non – Farm Employment Change has value *pearson correlation* or positive relation 0.882 (table 1) with a significant level of 0,000, indicating that the news has an effect on the exchange rate, and has a value of MSE 1.21000 (table 2) indicating that the NN-RBF method is good for predicting news non-farm employment change compared before using the NN method - RBF has MSE 5651.8 (table 3).

#### 4.7 Retail Sales

Retail Sales has value *pearson correlation* or positive relation 0.756 (table 1) with a significant level of 0,000, indicating that the news has an effect on the exchange rate, and has a value of MSE 1.21000 (table 2) indicating that the NN - RBF method is good for predicting news non-farm employment change compared before using the NN method - RBF has MSE 5651.8 (table 3).

### 5. Conclusion

After statistical tests on the news, there are 7 items that have a high and significant influence on the exchange rate, there are average hourly earnings, consumer confidence, consumer price index, gross domestic product, manufacturing index, non-farm employment change and retail sales . The news is used to employ predicted the value using the NN - RBF method. The mean square error results close to zero which means the NN - RBF method can be used in making predictions, this result supported by the fama theory that stock prices reflect all available information, it is suggested a solution for traders to use NN-RBF method in making predictions in the forex market. This study is one the use only one method of prediction. No other method is used to compare the prediction found and only use one currency is EUR/USD.

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# Analysis of Internal Control System on Inventory at University of X

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**Abstract.** The purpose of this study is to analyze internal control system related to inventory management at University of X and aims to provide a recommendation to manage problems that occurred. Audit report from State Development Audit Agency stated that the university has not conducted proper and adequate control activities. The method in this research is descriptive analysis in the form of case study. Data have been obtained through document analysis, observation, and in-depth interviews with informants. The results show that there are weaknesses of university in conducting control activities on inventory management. The weakness that has been found such as, at physical control of asset, where there is an activity that does not have a SOP and an unsophisticated flowchart for standard SOP on accepting, saving and distributing goods. The recommendation obtained from this study to organization related to control activities such as new SOP and other recommendation that can be applied to solve existing problems. The limitations of this study are the absence of audit reports from the university's internal audit team and the audit results of the accounting information system.

## 1. Introduction

University of X is a university located in Riau. In carrying out its internal control system, Riau University experienced problems that could hinder the effectiveness and efficiency of its inventory management. This problem is also reinforced by the findings of BPKP, that there is yet to be proper control activities equipped for inventory management and monitoring have not done periodically. This problem led to error in managing and reporting inventories

Looking at report of inventory position on balance sheet from 2016 to 2017 is known that inventory value at University of X has increased by 25%. So a good operational procedures and supervision of the implementation of such procedures are necessary in the institution's operational activities. Therefore, the researcher wants to do an analysis to institution operational procedure related to inventory management. This research will also provide recommendation of control activities on inventories management where this proposal is expected to help the institution to fix the existing problem.

This study is important to conduct because this study analyzes the components of control activities in depth to solve the problems. The purpose of this study is to analyze how control activities procedures done by University of X regarding inventory management and to give recommendation regarding control activities that can be applied in University of X to improve the effectiveness and efficiency of inventory management. This research is expected to provide benefits for the related institutions, where this research is expected to be input and consideration in designing improvements to the internal control function of University especially for control activities on inventory management. And for the academics, the results of this study are expected to be used in subsequent studies to add insight as well

as become a literary material and an additional source of information in conducting further research with a similar theme.

The scope of this study is a discussion that will only be limited to the internal control conditions focusing on control activities in University of X associated with the inventory management. The research method used in this research is case study with qualitative method analysis with one unit of analysis. This method is used because with this method the problem will be well analyzed. The unit of analysis on this research is University of X because the phenomenon that has been described in the background occurs in this unit analysis. The type of data that researcher uses in this study according to the source is primary data and secondary data. Primary data in this research is interview result with respondent of company employee that directly related to company activity. The other primary data is the result of direct observation done by the researcher on the unit of analysis. While the secondary data obtained from document analysis, including corporate organizational structure and related legislations.

This research consists of 4 chapter, such: introduction ,literature review, research methodology, discussion, and conclusion.

## **2. Literature Revie**

### *2.1. Internal Control*

According to Government Regulation No. 60 (2008), internal control is an integrated process that conducted by by the board of commissioners of management, and other personnel entities on every action and activities continuously to provide reasonable assurance about achievement of organization's objectives through the effectiveness and efficiency of operations, reliability of financial reporting, safeguarding state assets and compliance with applicable laws and regulations.

Mulyadi (2013) states that internal control definition is covering the organizational structure, method and standards that are coordinated in order safeguarding organization's wealth, ensuring the accuracy and reliability of accounting data, boosting efficiency and compliance with management policies. While Kumaat (2011) define internal control as a way to directing, monitoring and measuring organization's resources and also had a role in preventing and detection of fraud.

COSO (2013) elaborates possible limitations of an effective internal control system on the consequences of :

- Suitability of objectives established as a precondition to internal control,
- Reality that human judgment in decision making can be faulty and subject to bias,
- Breakdowns that can occur because of human failures such as simple errors,
- Ability of management to override internal control,
- Ability of management, other personnel, and/ or third parties to circumvent controls through collusion,
- External events beyond the organization's control.

According to COSO (2013) and Government Regulation No. 60 (2008), internal control consists of five interrelated components, which are:

- Control Environment
- Risk Assessment
- Control Activities
- Information and Communication
- Monitoring Activities

But only one component that will be explained in detail for this research which is control activities, because lots of problems related to inventory management that had been found are concerning this component and also State Development Audit Agency recommends organizations to improve university's control activities. Government Regulation No. 60 year 2008 stated that control activities is an action taken to overcome risks and the establishment and implementation of policies and procedures



to ensure that activity to address risks have been effectively implemented. This action prioritizing on main activities of the organization regarding risk assessment process. Control activities consisted of :

- Segregation of duties
- Authorization of transaction and activities
- System information controls
- Physical controls
- Institution performance review
- Human resources development
- Performance indicator establishment and review
- Accurate and timely recording
- Access restrictions
- Accountability for resources and recording
- Adequate documentation

### *2.2. Accounting Information System*

Bodnar (2010) states that accounting information system is computer based system created to transform accounting data into information. Documentation is required in an attempt to explaining how the system works. According to Romney and Steinbart (2015), the instrument that can be used in documentation system is Data Flow Diagram, Flowchart and Business Process Diagram.

### **3. Research Methodology**

This research is done through case study approach. The reason of this research using a case study approach because this research investigates a phenomenon in depth within unit analysis (Yin, 2009). This study also explores extensively the causes of problem that can arise in the organization. The purpose of this study is to portray precisely the phenomenon therefore, case study typologies in this study is descriptive case study. The unit analysis in this research is University of X therefore, the unit of analysis is a holistic or single unit of analysis. My research focused on problems in implementing control activities on inventory management at University of X. The research strategy has been employed to identify important problems in research area, and then find accurate solution of them (Mohojan, 2017).

The data collection procedure conducted in this research is by doing a preliminary survey at University of X to obtain information and description of the problems faced by the organization and then conducting an in-depth interviews are conducted several times to obtain data and information that help researcher to analyze the causes of the occurrence of existing problem and finding a proper recommendation for control activities to minimize or even eliminate the problem experienced by the institution. The interview was conducted head of finance subdivision, head of administration, internal affairs division, head of administration, internal affairs subdivision and general affairs staff who in charges managing inventory and another staff who charge managing state-owned property (BMN).

The data used in this research is in the form of primary data and secondary data. Primary data is a data obtained directly from the unit of analysis (Yin, 2003). The research instruments used are focus group discussion with several employee that directly responsible in university's operational activities related to inventory such as head of finance subdivision, head of administration, internal affairs subdivision and general affairs staffs as well as observations of university activities related to inventory. For collection of secondary data, researchers used both published and unpublished data. Published data are organizational structure and organizational vision and mission and also a set of legislation and other regulations related to the inventory management in university. While unpublished data are internal documentation obtained from University of X as in financial report of University of X, inventory position on balance sheet report and auditing report from BPKP.

Data analysis method used in this research is analysis of qualitative data with Miles and Huberman model with these stages. First, data reduction, a stage where relevant data and information collection was done so it can be used in analysis. Second, data display, a stage where data and information that

has been collected and analyzed is being displayed to show relation between phenomenon and what is really happening. Lastly, conclusion drawing/verification, a stage where researcher explain the answer for research problem which can be obtained from the results of research that has been done.

#### 4. Discussion

The outline of inventory management process at University of X starts from the needs planning process. In this process, University make proposed procurement request for a year's need, where the proposed value of the goods has been adjusted to last year's used and also with university's budget. After the proposal is approved by the Rector and also authorized by the Commitment Making Officer (PPK) then procurement will be held through the auction process. Once agreement is reached with the supplier in the auction process, usually the inventory will be available one day after the purchase order is made. The goods will be inspected by the inventory staff to ensure the fit of the physical condition as well as the quantity of the goods. Then the goods will be distributed to each unit on request that has been submitted. After all requests are met, the remaining supplies will be stored in the warehouse. But the number of inventory goods purchased at the time of the auction usually can not meet the needs for a year, so to overcome that problem, University will do a direct procurement. Every activity that occurs related to inventory will be recorded into the recording software which is the inventory application

This research analyze control activities on all of that process in inventory management according to Government Regulation No. 60 2008. Researchers used Government Regulation No. 60 year 2008 as standard because university is a part of government agencies which are what this rule is designed for. The result of control activities evaluation on inventory management at University of X based on Government Regulation No. 60 2008 can be seen in the following:

- Segregation of duties  
University of X has five stages in inventory management, so to implemented a good segregation the responsibility of each stages must be separated. Unfortunately, institution still not fully doing it in every process and duties. Although they already separated financial, and managing duties in different division. There is still one employee in general affairs division with several duties where he manage all of acceptance, distributing, inventorying and recording of goods activities. This duties should be separated from one and another.
- Authorization of transaction and activities  
Institution has established and implementing a good authorization of transaction and activities. This can be seen from the needs for authorization from superiors first before transaction can be processed. They also implemented a general and specific authorization, an example for general authorization is a fixed pricing range for purchasing and for specific ones is authorization of goods purchase transactions outside the auction process.
- System information controls  
Institution used two kinds of application system for recording its transaction which is Inventory Application and SIMAK-BMN. In using this application, only the employee who in charges have the id and password to access the application and only for their each representative works. Their computer also protected by using password. To reduce risk of an error in input data because the employee not used using this application, institution also established rules in mutation and rotation employee where this mutation/rotation only happen every four years so employee in charge don't change too frequently. But the institution never audits its information system either internally or externally.
- Physical controls  
Institution already had standard operational procedures (SOP) for several activities regarding inventories. But its been found that there are activities that has not been included in that SOP which is purchasing activities in the middle of period and also there is one work flow chart in that SOP that a bit unsophisticated so its hard to understand how transaction is being process. Institution provides a small warehouse for saving its inventories only employee in charges that has key to access it. But this warehouse doesn't have item's maps and there is no stock card.
- Institution performance review  
Review of institution performance done by general affairs and finance staff also by SPI team. First general affairs staff do a reconciliation of their data regarding inventories, after that they

will compare their data with transaction data that has been recorded by finance staff. They analyze and compare inventory values this year with last year. The SPI team do their review only when needed such as when it's been found by public accountant firm or BPKP that there is something wrong with their data, only then SPI team will do their work. Their work flow starts from doing preliminary survey to learn and figuring how their auditing work should be done and also how much sampling that's needed for testing.

- Human resources development  
Institution already posted their vision and mission on their official website which is [www.unri.ac.id](http://www.unri.ac.id) and also displayed it on their entrance door. On explaining description of each employee job desk, institution created a form with every things that need be done by one employee each year. Institution also send their employee for seminar and workshop in order to improve their competences.
- Performance indicator establishment and review  
Performance review already been implemented in institution where the head of administration, internal affairs subdivision will grade his/her staff works each month.
- Accurate and timely recording  
Institution record their work with an application so the reports from its will be accurate and timely.
- Accountability for resources and recording  
Institution has appointed one employee who in charge for authorization and also another employee to manage inventory in day-to-day basis. But because there is lots of things to do in managing inventory, that employee has a big responsibility.
- Adequate documentation  
Because institution used application for recording their transactions, there is not much printed documents that need to be archived. All of data has been documented and saved in application.

The weaknesses in doing control activities of inventory management that have been identified in institution and controls that should be done to minimize or even reduce the existing problems are:

- Segregation of duties  
The weakness that has been found is segregation of duties not fully implemented. It can be obtained from the job desk that one employee has covering almost all of stages in managing inventory which in planning, purchasing, receiving, inventorying and recording. To fixed this problem, institution should hire a new employee to share this workload and to reduced the risk of fraud.
- System information controls  
The weakness that has been found in system information is the application use never been audited. This can be fixed when the university conduct a periodical audit of information system.
- Physical controls  
Problem that has been found in physical control activities is the standard operational procedures that has been established not covering all of activities that happen in inventory like a purchasing activities in the middle of period. There is no standard procedure for that activities and also its been found that there is one work flow that has an unsophisticated design so its hard to understand how transaction being processed. Institution should create and design new standard operational procedure and work flow to fixed that problem. For the proposed standard operational procedure described as follows.

Table 1 illustrates work flow that should be implemented when doing a direct procurement. Where upon request, BMN staff makes proposed procurement of goods approved by Head of BMN subdivision and authorized by Commitment Making Officer. The purchase of goods is carried out by the Procurement Official and after the goods are purchased, will be submitted to the BMN staff to be distributed to the unit in need. While Table 2 is just an improve flowchart from the old SOP that university already owned.

**Table 1. SOP Design for Direct Procurement**

No	Aktivitas	Pelaksana						Mitu Baku			
		Unit Kerja/Fakultas/ Lembaga	Staf BMN	Kasubag BMN	Kabag UHTP	Pejabat Pengadaan Barang	PPK	Penyedia Barang	Persyaratan/ Perengkapan	Waktu	Output
1	Mengajukan permintaan barang								Formulir permintaan barang	1 hari	Terdata barang konsumsi yang akan diminta
2	Membuat daftar barang yang akan dibeli dan surat permohonan pengadaan								Formulir permintaan barang	1 hari	Terdata barang konsumsi yang akan dibeli
3	Menelaah daftar permintaan barang dan memberikan otorisasi								Daftar barang yang akan dibeli	30 menit	Terdata nya daftar pengadaan barang
4	Memberikan otorisasi dan mengajukan perencanaan pengadaan barang ke PPK								Daftar barang yang akan dibeli, Surat Permohonan Pengadaan Barang	30 menit	Terdata nya daftar pengadaan barang
5	Menyetujui perencanaan pengadaan barang								Surat Permohonan Pengadaan Barang	30 menit	Terdata nya daftar barang konsumsi
6	Membuat spesifikasi barang dan HPS								Dokumen isian dan HPS	3 hari	Diketahui nya informasi mengenai pengadaan
7	Menyiapkan dokumen terkait pengadaan barang								Dokumen isian terkait pengadaan	1 hari	Diketahui nya informasi mengenai pengadaan
8	Menetapkan penyedia barang								Do kumen spesifikasi dan HPS	3 hari	Ditetapkannya penyedia barang
9	Melaksanakan pengadaan barang								Barang Konsumsi	1 hari	Barang dibeli
10	Menyerahkan barang dan bukti pembelian serta serah terima barang								Barang Konsumsi, Bu kti Pembelian dan Serah Terima Barang	Sesuai kesepakatan	Barang tersedia
11	Menerima barang								Barang Konsumsi	Sesuai kesepakatan	Barang tersedia
12	Menginput seluruh data transaksi ke dalam aplikasi persediaan								Aplikasi Persediaan	1 jam	Tercatat data transaksi ke dalam aplikasi persediaan

**Table 2.** SOP Design for Accepting, Storing and Distributing Inventory Goods

No	Aktivitas	Pelaksana				Mutu Baku			
		Penyedia Barang dan Jasa	Pejabat Pengadaan Barang	Staf BMN	Kasubbag BMN	PPK	Persyaratan/Perengkapan	Waktu	Output
1	Menyerahkan barang dan mengisi Formulir Penerimaan Barang disertai Surat Pernyataan Kesanggupan						SPK, Formulir Penerimaan Barang	1 Hari	Barang dan Formulir Penerimaan sesuai dengan barang yang diterima
2	Menerima dan memeriksa Barang sesuai Surat Pesanan dan membuat Berita Acara Pemeriksaan Barang						Formulir Penerimaan Barang, Surat Pesanan	1 Hari	Barang dan Berita Acara Pemeriksaan
3	Membuat Berita Acara Serah Terima barang						Formulir Penerimaan Barang & Berita Acara Pemeriksaan	1 Hari	Berita Acara Serah Terima
4	Menerima dan memeriksa barang disertai Surat Pesanan dan Formulir Penerimaan Barang, bila disetujui menandatangani Berita Acara Serah Terima atau jika tidak setuju mengembalikan ke Penyedia Jasa						Formulir Penerimaan Barang, Surat Pesanan & Berita Acara Serah Terima	1 Hari	Barang tersedia
5	Menyimpan barang ke gudang						Barang yang tersedia	1 Hari	Barang tersedia dan tersimpan di gudang
6	Mencatat ke dalam aplikasi persediaan						Aplikasi Persediaan	30 Menit	Tercatat data transaksi ke dalam aplikasi persediaan
7	Melaporkan hasil penerimaan serta pemeriksaan barang ke PPK						Berita Acara Pemeriksaan & Berita Acara Serah Terima	1 Hari	Laporan

Another problem that has been found is the warehouse does not have a goods maps and goods that being saved in the warehouse does not have a stock card. To fix this, institution should design the goods map and also use a printed stock card for the goods in warehouse.

- Performance indicator establishment and review  
 The weakness that has been found in performance indicator establishment and review is the objectivity of employee in doing their review and assessment of their subordinate's performance. Because of the formulation used in the performance appraisal has an aspect where the final value obtained by the subordinate will affect the assessment of his superiors result in the reluctance in giving a bad scores when their subordinate not giving their optimal effort. To fixed this problem, institution should create a new key performance indicator where its really independent and not biased so the assessment will show the actual performance.
- Accurate and timely recording  
 The problem that has been found is a delay in recording inventory transactions occurring into inventory applications. The deferred transaction in its input into the application system is the transaction of goods requests from the unit, the general affairs staff usually will collect several transactions first, before input it into Inventory Application. This problem can be fixed with a good implementation of monitoring system where the supervisor really oversees the work of their subordinates.
- Accountability for resources and recording  
 The weakness that has been found in accountability for resources and recording is related to the problem in segregation of duties. Because there is no segregation of duties in managing the inventories then the responsibilities held by employees become too big. So the solution for this problem is the same as the solution for segregation of duties which is the institution should hire a new employee so they can share workload and responsibility.
- Adequate documentation  
 The weakness in adequate documentation is there is storage cabinet exclusively for inventory related document so the archived of inventory documents is still mixed with other asset

transaction documents. Institution should provide at least a space exclusively to archive documents that related in inventory management.

However as COSO states regarding the importance of personnel in internal control, no matter how well the system is designed and implemented if the personnel is not ready to implement it then the expected results and goals to be achieved to be hampered. So it takes the cooperation and seriousness of the employees in the implementation of control activities and managing the inventory.

## 5. Conclusions

The purpose of this study is to analyze internal control system that focused on control activities related to inventory management at University of X and aims to provide a recommendation to manage problems that occurred. The results show that there are weaknesses of university in conducting control activities on inventory management. The weaknesses found are segregation of duties is not evenly apportioned, accounting information system is not audited, the SOP does not cover the entire activity, unsophisticated flowchart, there is no map and stock card in warehouse, the assessment performed by the superiors at their subordinate's performance not objective, delay in inputting data to inventory application, the responsibility of inventory staff is too big, there is no specific place to store inventory documentations.

This research implication are university should hire a new employee to share some workloads and responsibility, do audit on system information regularly, use the proposed standard for direct procurement and a new flowchart. Also, equipped the warehouse with maps and stock card, design a new key performance indicator, implement a good monitoring system and also provide an exclusive space for inventory documentation.

This study has a few limitation. First, researchers can not access the audit report of the internal control team of university and also there is not much data can be collected regarding accounting information system. So for further research, researchers suggest to analyze more comprehensively the performance and role of the organization's internal audit team and collect more data on accounting information systems such as audit reports.

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# The Implementation of Prudential Banking Principle In The Process of Channeling of Funds At Bank Riau Kepri Based on Banking Law

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**Abstract.** A bank is a company whose business activities raise funds from the community, channel funds to the public, and provide financial services. Of the three business activities of the bank, the activity of channeling funds is an activity that is a source of income spread to banks. However, large profits are directly proportional to the high level of risk, namely the occurrence of non-performing loans. What is the implementation of prudential banking principle in the process of channeling funds to Bank Riau Kepri under the Banking Act? The method used in this research is socio-legal research. The results of this study that based on Law Number 10 of 1998 about Banking, credit provided by banks contains risks, so that in its implementation banks must pay attention to sound credit principles. To reduce this risk, before giving credit, banks must make a careful assessment of the character, ability, capital, collateral and business prospects of the customer, or better known as the principle of 5C (character, capacity, capital, collateral, and condition). The implementation of prudential banking principle in the process of channeling funds to Bank Riau Kepri is regulated in the form of Decree of the Board of Directors of Bank Riau Kepri Number 22 / KEPDIR / 2013 about Bank Credit Policy.

**Kata kunci:** Banking; Prudential Banking Principle; The Implementation

## INTRODUCTION

In Indonesia, as mandated by Pancasila and the 1945 Constitution of the Republic of Indonesia, the goal of national development is the creation of a just and prosperous society based on economic democracy by developing a just economic system. In order to ensure the ongoing economic democracy, all the potentials, initiatives and creative power of the people must be mobilized and fully developed within limits that do not harm the public interest, so that all potential economic forces can be mobilized into real economic forces for the benefits of improvement. prosperity of the people. In order to achieve this goal, the implementation of economic development must pay more attention to harmony, harmony and balance of the elements of development equality, economic growth and national stability. One institution that has a strategic role in harmonizing, harmonizing and balancing each element of the development trilogy is banking.

Banking is everything related to banks, including institutions, business activities, and

ways and processes in carrying out its business activities. In simple terms, banks are defined as financial institutions whose business activities are collecting funds from the community and channeling the funds back to the community, as well as providing financial services (Kasmir, 2012). Correspondingly, based on Article 1 of Act Number 10 of 1998 concerning Banking, it is explained that banks are business entities that collect funds from the public in the form of deposits and channel them to the public in the form of credit and / or other forms in order to improve the living standards of the people many.

From the above definition, it is known that the business activities of a bank are collecting funds, distributing funds, and providing services. The Bank collects funds from the public in the form of deposits in the form of savings, time deposits and demand deposits by providing cash compensation, known as bank interest, to the public in accordance with the nominal amount of its deposits. After raising funds, the bank channels it to the public in the form of loans in the form of loans by asking for interest in the form of interest to the public in accordance with the nominal amount of the loan. In addition, banks also provide financial services that can provide convenience to the public in carrying out various financial transactions, such as money transfer services that can send money remotely within seconds.

Of the three business activities of the bank, lending activities are business activities that are a source of income spread to banks. However, large profits are directly proportional to the high level of risk, namely the occurrence of bad credit. Bad loans are defaults made by customers because customers do not fulfill their obligations to pay credit installments to banks as agreed in the credit agreement. Bad credit has the potential to be experienced by a bank because banks lend money to customers in cash while customers return it to the bank in installments in accordance with a mutually agreed time period.

This research was conducted at Bank Riau Kepri. Bank Riau Kepri is one of the companies owned by the Riau Provincial Government and the Government of the Riau Islands Province. From the observations made, the researchers obtained information that there were problems regarding the existence of non-performing loans caused by the lack of implementation of the prudential banking principle. In fact, some of them culminated in corruption cases. One of them is that in 2016, a corruption case was discovered at Bank Riau Kepri Pelalawan Branch in the form of a fictitious credit distribution of 50 billion rupiah to the Panca Ekatama Palm Farmer Cooperative.

From the background of the problems described above, the problem that will be discussed in this study is how is the implementation of prudential banking principles in the process of channeling of funds at Bank Riau Kepri based on Banking Law?

## **METHOD OF RESEARCH**

Legal research is a scientific activity that is based on certain methods, systematics, and thoughts, which aims to study one or several specific legal symptoms by analyzing them (Soerjono Soekanto, 2007). The research method used in this research is socio-legal research. Data sources used in this research are primary data and secondary data. Primary data is data obtained directly from the results of observations and interviews at the research location; while secondary data is data obtained from scientific journals, legal literature, and legislation. Data collection techniques used in this research are observation, interview, and literature study. The data analysis technique used in this research is qualitative analysis.

## **RESULT OF RESEARCH AND DISCUSSION**

Law Number 10 of 1998 about Banking confirms that banks are required to implement prudential banking principles in all of their business activities, including lending activities. In Article 8 of Law Number 10 of 1998 about Banking, it is explained that in distributing credit, banks must have confidence based on a good analysis of the intention and ability and ability of the customer to repay the debt as agreed. Therefore, in channeling credit to the community, banks must implement measures that do not harm their business and also do not harm the rights of customers who trust their money to be kept in the bank. This is because the money channeled by the bank in the form of credit is public money that is kept in the bank on the basis of trust, so the bank must continue to maintain the level of health and public trust in it.

Indonesian people have lost confidence in banks during the 1998 economic crisis. The economic crisis has become a destruction for the national banking system because many banks have not implemented prudential banking principles in managing their business activities. The concrete evidence that resulted from this was the freezing of the efforts of 38 private banks, including Ciputra Bank, Ganesha Bank, Pesona Bank, Alfa Bank, Aspac Bank, and so on. Furthermore, there are 7 private banks taken over by the government, namely RSI Bank, Putera Sukapura Bank, POS Bank, Artha Pratama Bank, Nusa Nasional Bank, Jaya Bank, and IFI Bank. In addition, there are also 4 state-owned banks, namely Dagang Bank, Exim Bank, Bumi Daya Bank, and Bapindo which were collapse and merged into Mandiri Bank (Andrew Shandy Utama, 2018).

The prudential banking principle means that the bank and the people involved in it, especially in making policies and carrying out their business activities, are obliged to carry out their respective duties and obligations carefully, thoroughly and professionally so as to gain

public trust. In addition, the bank in making policies and carrying out its business activities must always comply with all laws and regulations that are consistent with the basis of good faith. Trust from the community is the key to developing or not operating a bank's business (Hermansyah, 2006).

Implementation of prudential banking principle in the process of channeling funds to Bank Riau Kepri regulated in the Decree of the Directors of PT Bank Riau Kepri Number 22 / KEPDIR / 2013 concerning Bank Credit Policy, which covers the principal policies in credit, procedures for assessing credit quality, professionalism and integrity of credit officials , the code of ethics for credit officers, as well as sanctions for violations.

### **1. Principal Policy in Credit**

The main policy in credit is a policy that must be carried out each will give credit to prospective borrowers or debtors by always taking into account the principle of benefit, which is beneficial and beneficial for the bank, beneficial to economic growth, and beneficial to the business development of the debtor while still prioritizing the principle of prudence .

The principal policies in credit include healthy credit procedures, application of risk management, ceiling or capitalization, handling of non-performing loans, establishment of loan allowance, allowance for impairment losses, write-off loans, collectible loans, collateral credit, maximum lending limit, credit determination which contains high risks, prohibited credit, policies for setting credit interest rates, credit guarantee policies, policies to support foreign trade (export-import) and domestic activities (buying and selling), as well as annual credit budgets.

### **2. Procedure for Evaluating Credit Quality**

Bank Riau Kepri assesses credit quality in accordance with the regulations set by Bank Indonesia. The implementation of credit analysis at Bank Riau Kepri in accordance with existing operational standards by using the principle of 5C to assess character, capacity, capital, condition, and collateral.

### **3. Professionalism and Integrity of Credit Officials**

Commissioners, Directors, officials, and all employees of Bank Riau Kepri who are related to credit must uphold professionalism in the credit sector and understand the provisions of the Banking Law, Bank Indonesia Regulations and internal bank regulations.

### **4. Credit Officer Code of Ethics**

All officials and employees in charge of credit must comply with the code of ethics as follows:

- a. Obedient and obedient to the prevailing laws and regulations and credit regulations, both external and internal.
- b. Independent, honest and objective.
- c. Do not abuse his authority for personal, family and / or other parties.
- d. Avoid involvement in decision making in the event of a conflict of interest.
- e. Must take into account the impacts that can be detrimental to any policy of granting credit to economic, social and environmental activities.
- f. Do not accept any gifts or rewards that affect their professional opinion in credit assessment or decisions.
- g. Do not carry out disgraceful actions that can harm the image of the profession.
- h. Maintain the confidentiality of customers and banks.
- i. Avoiding unhealthy competition.

#### **5. Sanctions for violations**

An official or employee related to credit can be penalized if:

- a. Conduct acts against the law and the prevailing laws, including, among others, making engineering and practices that deviate from banking provisions; conduct actions that can be categorized as providing benefits to owners, managers, employees and / or other parties that can harm or reduce the profits of the bank; and actions that violate the principle of prudence in granting credit.
- b. Conduct violations / irregularities in the Code of Ethics of Bank Credit Officers.
- c. Conduct violations and irregularities or not comply with the statutory provisions and credit regulations that have been regulated in this decree.

## **CONCLUSION**

A bank is a company whose business activities raise funds from the community, channel funds to the public, and provide financial services. Of the three business activities of the bank, the activity of channeling funds is an activity that is a source of income spread to banks. However, large profits are directly proportional to the high level of risk, namely the occurrence of bad credit. Based on Law Number 10 of 1998 about Banking, loans provided by banks contain risks, so that in its implementation banks must pay attention to sound credit principles. To reduce this risk, before giving credit, banks must make a careful assessment of the character, ability, capital, collateral and business prospects of the customer, or better known as the principle of 5C (character, capacity, capital, collateral, and condition). Implementation of prudential banking principles in the process of channeling funds to Bank Riau Kepri regulated

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# Knowledge Management, the Role of Strategic Partners, Good Corporate Governance and Their Impact on Organizational Performance

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**Abstract.** This study aims to examine the role of knowledge management, the role of strategic partners, and good corporate governance and their impact on the performance of hospital organizations. Knowledge management consists of knowledge management enablers (strategy and leadership, organizational culture, information technology, and organizational information systems), and knowledge management processes (socialization, externalization, combination and internalization). An approach that refers to agency theory and knowledge-based theory is used to explain the performance of hospital organizations. The survey was conducted by distributing questionnaires to the level of managers and directors at the hospital. The data analysis technique used is a structural equation modelling (SEM) approach. The results show that knowledge management enabler is able to encourage the role of knowledge management processes that influence improving organizational performance. The role of doctors as strategic partners has a significant effect on corporate governance. The results also prove the good corporate governance has a significant effect on organizational performance.

## 1. Introduction

Organizational performance is a strategic aspect in management that plays a role in developing, implementing, and evaluating a strategic plan [1] [2]. Organizational performance measurement is expected to evaluate how well an organization achieves its goals. In measuring performance, some companies consider if they only believe in financial indicators to measure performance, it can bring short-term results. Thus, financial performance only is not enough to assess organizational performance. Kaplan and Norton [3] introduced a balance scorecard that offers measurement of financial performance and non-financial performance as well as to assess organizational performance. Non-financial performance includes intangible assets in organizations related to knowledge. Knowledge management can be applied as a strategy towards organizational success [4] [5]. Knowledge is an important factor in business development. Although some forms of intellectual creativity can be transferred, intrinsic knowledge is not easily transferred. Therefore, the main objective of management is to improve the process of acquisition, integration and utilization of knowledge which is better known as knowledge management [6]. Knowledge management still has obstacles. One of the obstacles is that organizations sometimes do not understand what they know [7]. Certain skills and knowledge that employees have sometimes have no value to their colleagues and superiors, because those who can use this knowledge do not understand and are not aware of their existence [8]. Therefore, understanding knowledge management elements is expected to improve performance. Research by [9] [10] [4] shows there are effects of knowledge management towards organizational performance. Research on knowledge management is mostly done in the knowledge-intensive and innovative manufacturing sector [11] [12], but research in the health services industry has received less attention such as hospitals in Indonesia.

### *1.1 Knowledge Management and Strategic Partners*

Knowledge management (KM) consists of a variety of different elements. Factors affecting interrelated knowledge management are explained by 7 enablers, namely collaboration, learning, trust,

centralization, formalization, t-shaped skills, and information technology. To manage knowledge information effectively through the knowledge management process, it emphasizes on socialization, externalization, combination and internalization [13].

KM is closely related to human resources. Strategic planning formulated to achieve organizational performance depends on the capabilities of human resources who will compile and realize the strategic plan. Human resource executives (HR) are seen as strategic partners with other executives and actively involved in strategic decision making. In the hospital, the role of doctors and paramedics is considered a strategic partner. The role of strategic partners focuses on activities that match HR practices and strategies with company strategies [14]. HR strategy practices and innovation performance by mediating the capacity of knowledge management are shown by [11]. [15] shows the significant influence of strategic partners on the capacity of innovation and business performance. While strategic partners associate HR with organizational performance [14]. Referring to the importance of strategic partners in the health service industry that requires high knowledge, technology and skills, the role of human resources as strategic partners is expected to improve the performance of hospital organizations. Knowledge management (KM) consists of a variety of different elements. [13] shows the effect of enablers on knowledge management and knowledge management processes. Factors affecting interrelated knowledge management are explained by 7 enablers, namely collaboration, learning, trust, centralization, formalization, t-shaped skills, and information technology. To manage knowledge information effectively through the knowledge management process emphasizes socialization, externalization, combination and internalization.

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### *1.2 Corporate Governance*

Corporate governance is positively associated with organizational performance [16] [17], as well as [18] explaining that good corporate governance can predict future performance. Many research results explain the relationship between corporate governance and organizational performance using secondary data, the concept refers to agency theory. The level of association is indicated by the size of the audit committee, independent audit committee, foreign ownership, institutional ownership, large board size, board expertise, management expertise, length of CEO positions, dividend policy, and annual meetings related to organizational performance. But relatively less research is directed to use questionnaire surveys in the health industry using the principles of good corporate governance. Thus, the contribution of studies in hospitals related to corporate governance and organizational performance can improve organizational performance. Partial improvement in organizational performance can be influenced by many factors including intellectual capital and knowledge management [19], knowledge management and the role of strategic partners [14], good corporate governance [17] [20]. This research is considered important to answer and contribute empirical results on the role of knowledge management enablers, knowledge management processes, strategic human resources partners and corporate governance on improving organizational performance. This research is a development of [19], [14] and [18].

Knowledge management resources relate to human resources. Therefore, to optimize strategic planning and implement it effectively in order to achieve organizational performance is largely determined by the capabilities of human resources. The role of human resources as strategic partners is directed at efforts to monitor and adjust human resource practices and strategies and corporate strategies. In this



case the executive acts as a strategic partner that encourages the success of the company's strategy to achieve the desired organizational performance. [11] shows that strategic human resources affect performance. The researcher is more focused on strategic human resources only as an administrative expert, not as a strategic partner. Research into the role of human resources as strategic partners in hospitals is difficult to obtain. Based on this, the main problems which need to be addressed are to what extent knowledge management, the role of HR strategic partners, and good corporate governance can have an impact on the organization's performance.

### *1.3 Knowledge Based and Agency Theory*

The relationship perspective of Jensen and Meckling agency theory is able to explain corporate governance issues [21]. Eisenhardt revealed that the main focus in agency theory to overcome agency problems is how to determine the optimal contract design between agent and principal. There are three assumptions of human nature in agency theory, namely self-interest, limited future insight (bounded rationality), and risk aversion. Based on these characteristics, management as an agent who is given the task of managing the company tends to make decisions according to personal interests rather than for the interests of the principal, perhaps because the agent has more information about the condition of the company than the principals. Organizations are encouraged to adopt the application of good corporate governance to improve organizational performance and to protect the interests of shareholders [17]. Thus, the existence of corporate governance is expected to reduce agency costs. A study in Hong Kong that is strong with family, makes several things in corporate governance unable to function properly. The main issue in the Hong Kong market which becomes the agency conflict is between insider and outside shareholders [18]

The relevant theory to show the importance of the role of knowledge management is the knowledge-based theory developed by Grant [10]. The source of competitive advantage in a dynamic business environment is not the knowledge that lies with the organization, because such knowledge values are easily eroded obsolescence. Competitive advantage is precisely determined by the knowledge that is not possessed in the form of knowledge contained in individuals. Because knowledge is owned by individuals and not organizations, an important element of competitive advantage is the ability to integrate specialization with individual knowledge. The main idea of this theory is that the organization exists in its way, because its ability to manage knowledge more efficiently than other forms of organizational structure. In short, organizations are social entities that use and store internal knowledge, competencies and capabilities that are vital to the sustainability of the company, grow and succeed [22]. Based on the background of the problem and the literature review above, the following hypothesis can be formulated:

- H1a: KM enabler affects the role of strategic partners
- H1b: KM enabler affects good corporate governance
- H1c: KM enabler affects organizational performance
- H1d: KM enabler affects the knowledge management process
- H2a: KM process affects the role of strategic partners
- H2b: KM process affects good corporate governance
- H2c: KM process affects organizational performance
- H3a: The role of strategic partners affects organizational performance
- H3b: The role of strategic partners affects good corporate governance
- H4: Good corporate governance affects organizational performance

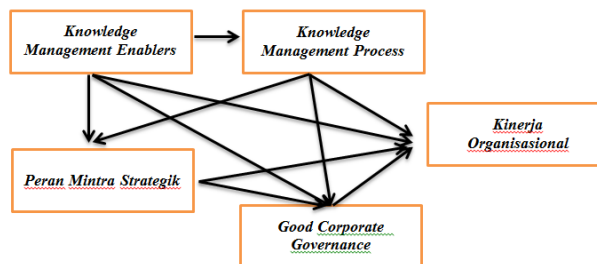


Figure 1. Research Model

## 2 Method

The data in this study were obtained through surveys by distributing questionnaires to respondents. This research was carried out in government hospitals and private hospitals in the city of Pekanbaru. Data collection was done through survey. Respondents of this study were leaders of upper level and middle level hospitals consisting of Directors, Deputy Directors, Managers, Heads of Departments / fields. They were chosen because at this level knowledge is needed with high professional mastery. At the hospital, 4 respondents were chosen representing the organization and the analysis unit was the organization. Reasons for choosing the Hospitals in Pekanbaru are because of variations in accreditation levels in hospitals representing hospitals in Indonesia that have hospitals with accreditation of National and International Hospitals. The variable size of knowledge management refers to [13], while the role of strategic partners is used by the measurement used by Sintaasih [14], good corporate governance refers to KNKG [20] and the size of the variable organizational performance refers to [23]. The data analysis technique used is a structural equation modelling (SEM) approach. The reason is because the variables used in this study cannot be measured directly or latently. SEM is used to analyse the pattern of relationships between latent constructs and indicators

## 3 Results

The results of the analysis for testing the effect of constructs presented in Figure 1 are a research model by observing the path diagram of the PLS analysis results at the final stage, so the relationship between constructs is illustrated as shown in Figure 2.

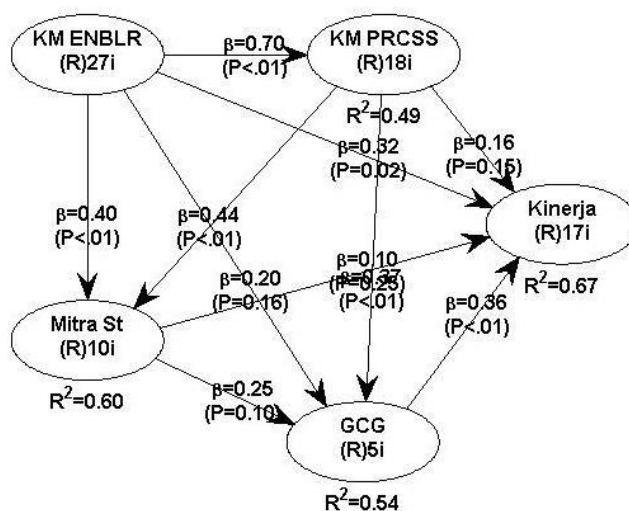


Figure 2. Pathway diagram resulting from hypothesis testing

Based on the path diagram the relationship between KME and KMP with path coefficients 0.7 and  $p < 0.01$  means a positive and significant effect. This means that knowledge management enabler influences the knowledge management process. Thus, H1d is accepted. Knowledge management process will run better if supported by KME. Knowledge management regarding collaboration, trust, learning, centralization, formalization, t-shaped skills and information technology support can influence the process of socialization, externalization, combination and internalization of knowledge. The

relationship between KMP and Performance can be shown by the path coefficient 0.16 and  $p = 0.15$ . This shows a positive effect on KMP on performance but not significant because  $p > 0.05$  thus H2c is rejected. While the relationship between KME on Performance is shown by the path coefficient of 0.32 and  $p = 0.02$  which means that there is a positive and significant relationship so H1c is accepted. The relationship between the KME towards the role of strategic partners (PartnersSt) is shown by the path coefficient 0.4 and  $p < 0.01$ , thus H1a is accepted. The KMP calculation for St Partner is indicated by the path coefficient 0.437 and  $p < 0.01$ . The process of knowledge management for socialization, externalization, combination and internalization affects the role of strategic partners or in other words H2a is accepted.

The relationship of strategic partner roles to GCG is indicated by the path coefficient 0.25 and  $p = 0.1$  significant at  $p = 0.1$  in other words the H3b hypothesis is accepted. While the relationship between KME to GCG is indicated by the path coefficient 0.201 and  $p = 0.16$  thus H1b is rejected. For KMP calculation of GCG, the path coefficient results are 0.366 and  $p = 0.006$ , so H2b is received. For St Partner's calculation of organizational performance path coefficient = 0.101 and  $p = 0.246$  where  $p > 0.1$  so hypothesis 3a is rejected. While the relationship between GCG towards organizational performance is shown by the path coefficient 0.36 and  $p < 0.01$  so that H4 is accepted. The principles of good corporate governance can affect organizational performance.

Table 2. Conclusion of the Testing results

Article I.	Ef	Article II.	Coeff.	Article III.	P	Article IV.	Description
fect		Path		value			
Article V.	K	Article XV.	0,701	Article XXV.	<0,	Article XXXV.	Significant
ME towards KMP		Article XVI.	0,404	001		Article XXXVI.	Significant
Article VI.	K	Article XVII.	0,201	Article XXVI.	0,0	Article XXXVII.	Not significant
ME towards Partners St		Article XVIII.	0,319	03		Article XXXVIII.	Significant
Article VII.	K	Article XIX.	0,366	59	0,1	Article XXXIX.	Significant
ME towards GCG		Article XXI.	0,156	Article XXVIII.	0,0	Article XL.	Significant
Article VIII.	K	Article XXII.	0,245	16		Article XLI.	Not significant
ME towards Performance		Article XXIII.	0,101	Article XXIX.	<0,	Article XLII.	Not significant
Article IX.	K	Article XXIV.	0,357	001		Article XLIII.	Not significant
MP towards Partners St				Article XXX.	0,0	Article XLIV.	Significant
Article X.	K			06			
MP towards GCG				Article XXXI.	0,1		
Article XI.	K			46			
MP towards Performance				Article XXXII.	0,0		
Article XII.	M			99			
itra St towards GCG				Article XXXIII.	0,2		
Article XIII.	M			46			
itra St towards Performance				Article XXXIV.	0,0		
Article XIV.	G			02			
CG towards Performance							

#### 4 Conclusion

The effect of KM enablers on organizational performance proves to be significant, while the influence of KM on organizational performance is not mediated by KM processes. Thus, the efforts to improve organizational performance are driven by increasing enablers. KM regarding strategy and leadership can improve organizational performance, organizational culture can affect organizational performance. Elements that become enablers in KM can directly affect organizational performance. The role of strategic partners in organizational performance has a positive but insignificant effect. While good corporate governance has a positive and significant effect on organizational performance. In general, KM, the role of strategic partners and GCG influence organizational performance.

From the results of this study, KM processes can be of particular concern to the company. In addition to improving organizational performance, it can also enhance the role of strategic partner HR in the internal company. However, research results may be different because of differences in conditions in geographical areas with different organizational cultures.

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# Analysis of Strategic Costing Effect towards University Performance with Competitive Advantage as Mediating

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**Abstract.** This study aims to examine the effect of Strategic Costing on organizational performance through competitive advantage as moderating variables in private universities in the city of Pekanbaru. The samples in this study are 39 universities in the city of Pekanbaru. This research deploys a survey by distributing questionnaires to the head of the finance department and then the data is processed using path modeling analysis techniques with PLS tools. From the research conducted, the researchers found that strategic costing directly affects the performance of universities and indirectly competitive advantage mediates the strategic costing relationship to the performance of universities in the city of Pekanbaru.

## 1. Introduction

### 1.1 Background

Higher Education is an institution engaged in educational services to produce quality human resources, where the management process must take into account various aspects of its resources, one of which is the financial aspect. The financial aspect is about income and costs. In principle, to be able to operate properly, the income earned by universities must be greater than the costs incurred.

In general, university income is easy to predict, but not the cost. To anticipate cost uncertainty, an instrument is needed which is known as strategic costing. Through strategic costing, universities will be able to carry out educational, teaching, research and community service activities effectively and efficiently as competitive advantages that can ultimately improve the performance of universities.

According to Aykan and Aksoylu (2013), strategic costing is part of the SMAT. Strategic costing is the use of market-oriented strategies and costs to prioritize and develop strategies that can provide sustainable competitive advantage. Strategic costing itself can be measured through 5 indicators; including activity based costing, target costing, value chain costing, quality costing, and lifecycle costing (Cadez and Guilding, 2008).

Research on the relationship of strategic costing to performance shows some contradictory results. This study aims to determine the direct effect of strategic costing as a strategic management accounting directly on the performance of universities and the indirect effect of strategic costing on the performance of universities with mediating variables of competitive advantage.

## 2. Conceptual Framework and Literature Review

### 2.1. Contingency theory

The basic thesis of the contingency approach is that there is no concept or design of the entity that will be applied universally anywhere or under any conditions effectively (Otley, 1980). An entity design is only suitable or fit for a particular context or condition. The use of a contingency approach encourages researchers to identify suitable conditions for the design of certain entities and develop theories that support them (Riyanto, 1999). Contingency theory identifies optimal forms of entity control under different operating conditions and explains how operating procedures control the entity.

## 2.2. *Institutional Organization Theory*

To achieve competitive advantage, paying attention to external factors of the entity is a must. In the I/O theory, it is explained that external factors (industry) are more important than internal factors in the entity to achieve competitive advantage. The main concern in I/O theory is competition. Strength structure analysis in competition, which is better known as the Five Forces Model (Porter, 1985) becomes an important thing. There are five things in the Five Forces Model, namely: (1) Competition among similar entities, (2) Possibility of new competitors to come, (3) Potential of developing substitute products, (4) Bargaining strength of sellers/suppliers and (5) Bargaining strength of buyers/consumer.

## 2.3. *Strategic costing relationship with university performance*

Strategic cost management is defined as the use of market-oriented strategies and costs as well as data to prioritize and develop strategies that can provide sustainable competitive advantage (Cadez and Guilding, 2008). Aksoylu and Aykan (2013) divide strategic costing in 5 dimensions, namely:

### 1. *Activity based costing (ABC)*

Activity Based Costing is an analytical technique that allocates factory overhead costs to production activities (Alnawayseh, 2013).

### 2. *Value chain costing*

Value chain costing is an analytical technique to add value to customers by reducing costs, and understanding the relationship between company business and customer needs (El-Dyasty, 2007).

### 3. *Target costing*

Target costing is a cost that can be charged to the company in accordance with competitive prices, which can be used to achieve the desired profit (El-Dyasty, 2007).

### 4. *Lifecycle costing*

Lifecycle costing technique is defined as the result of the calculation of all costs of a product during the product life phase

### 5. *Quality costing*

Quality costing is the cost of detecting and improving the quality of goods and services (Hansen and Mowen, 2006). Jaju and Lakhe (2009) in the journal of (Kirliloglu and Cevik, 2013) divide quality costs into 3 main parts, namely PAF (Prevention-Appraisal-Failure).

If the higher education institution has a strategic costing, of course the operational costs of both the direct cost group and indirect costs are issued based on the activity so that it is easier to control. Thus the costs that have no added value will be lost on their own so that operational costs are more efficient and effective and ultimately the performance of the organization will increase. This is in line with research findings where costing strategies have a positive effect on organizational performance (Zaman, 2009; Arasteh and Dalfard, 2011; Griffith, 2006; Saaydah and Khatatneh, 2014; Aykan, E and Akso, 2014; Shinta and Devie, 2015)

H1: Strategic costing has a positive effect on university performance.

## 2.4. *Strategic costing relationship with competitive advantage*

Strategic costing is the use of strategies and costs as well as calculated data that is customer oriented so that the organization can maximize its resources to produce quality products or services that can ultimately meet customer satisfaction. Thus the strategic costing can maintain the sustainability of the organization because the product or service provided is superior in competition. This is in line with the results of research that costing strategies have a positive effect on competitive advantage (Gecevaska, 2010; Reed, Lemak and Mero, 2000; Ghafeer et al, 2014; Ghatebi et al, 2013; Shinta, and Devie 2015).

H2 : Strategic costing affects the competitive advantage

## 2.5. *Competitive advantage relationship with university performance*

Competitive advantage is the advantage gained from competitiveness by giving consumers a higher value, either at a lower price or providing greater benefits and services at a higher price (The International School of Management, 2012). According to Porter (1985), there are 2 strategies that can be used to create competitive advantages, namely:

### 1. *Cost leadership*

Cost leadership can be defined as the company's efforts to produce excellence by achieving the

lowest costs in the industry.

2. *Differentiation*

Porter (1985) said that competitive advantage is related to the development of attributes that can give characteristics to the company and provide different values from competitor products.

Competitive advantage is giving more value than the product or service provided to the customer so that the product or service gives satisfaction to the customer. Thus, it will guarantee the sustainability of the organization and ultimately can improve organizational performance. This is in line with the results of competitive advantage research that has a positive effect on organizational performance (Tuan and Yosi, 2010; Shinta and Devie, 2015; Aksoylu and Aykan, 2013)

H3 : Competitive advantage affects the university performance

2.6. *Competitive advantage mediates the relationship of strategic costing with university performance*

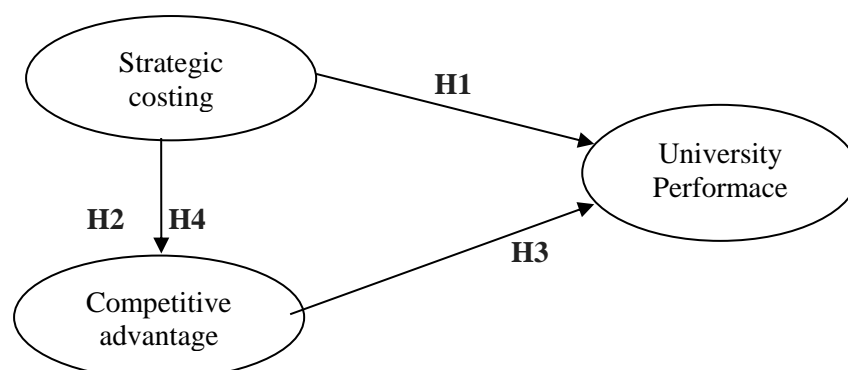
Integrating the logic of the argument above, the researchers hope that the strategic costing will occur positively related to competitive advantage, and so will the excellence of competition with university performance. In addition, the researchers place mediation between the strategic costing relationship, competitive advantage, and university performance.

Regarding mediation offer, Hayes (2013) as well as Baron and Kenny (1986) explained that mediation tests determine the existence of a significant intervention mechanism (in our case it is a competitive advantage) between a predictor variable (strategic costing) and a result variable (university performance). Thus, mediator variable (ie, competitive advantage) contributes to a significant proportion of the relationships between predictors and variable (outcome) criteria. As discussed above, the competitive advantage perspective provides a theoretical explanation for the mediating effect of the costing and university performance relationship. Strategic costing offers opportunities for organizations to manage their resources more effectively and efficiently so that operational activities are more directed and in line with the targets to be achieved both short and long term. In addition, strategic costing provides learning to organizations in managing costs considering the potential and weaknesses they have. The learning in organizational management is very valuable because every cost incurred will provide added value for the quality of the product or service so that customer satisfaction will increase. Thus strategic costing encourages organizations to realize quality products or services that will enhance competitive advantage and ultimately improve organizational performance.

Empirical research provides evidence for the mediating effect of competitive advantage between strategic costing and university performance. Research findings revealed that competitive advantage affects performance (Tuan and Yosi, 2010; Shinta and Devie, 2015; Aksoylu and Aykan, 2013. Based on the previous researches, it can be concluded that this relationship could also apply to competitive advantage. As previously mentioned, competitive advantage has a positive effect on competitive advantage, and strategic costing is positively related to competitive advantage. Therefore, it can be said that the implementation of competitive advantage can provide an organizational management to interpret the strategic costing effect on university performance.

H4 : Competitive advantage mediates the relationship of strategic costing with university performance.

The conceptual framework is as follows:





### 3. Research Methodology

#### 3.1. Context of Study

Pekanbaru is a very appropriate context to test the hypothesis of this research, because the number of private higher education in the city of Pekanbaru has increased every year, which has caused competition. The high impact of the number of tertiary institutions is the emergence of a level of competition that in the end, in order for the tertiary institutions to continue to exist, there needs to be an effort or strategy in management to be effective and efficient, which in turn can improve the performance of the university, especially in the cost called strategic costing. In implementing the strategic costing as a strategic management accounting technique, the institution strives to realize operational costs consisting of education and teaching, research, service and other operational costs effectively and efficiently. Here we discuss briefly some strategic costing attributes including activity based costing, life cycle costing, quality costing, target costing, and value chain in managing organizational costs by considering the resources that are owned to run more effectively and efficiently so as to increase competitive advantage and the university performance.

#### 3.2. Population and Sample

The population of this study is the leaders, heads of finance and financial staff at private universities that are included in LL Dikti Region X. While the samples we choose are private universities in the city of Pekanbaru totaling 39 universities. Data was collected using questionnaires and online surveys targeted at the head of the finance department. Data collection took place between February 2018 and April 2018. The main respondents are the head of finance. The questionnaires were distributed directly and online surveys were conducted. Questionnaires sent were 117 while received back as many as 100 (84.47%). From the questionnaire received, not all questionnaires can be analyzed because as many as 3 questionnaires returned are incomplete or returned empty. Questionnaires that can be further processed are 97 questionnaires or 82.90% of the total questionnaires distributed. We tested the conceptual model proposed using variance-based structural equation modeling (SEM).

#### 3.3 Measurement

We build three latent variables, namely strategic costing, competitive advantage and university performance, using a multi-item scale. The validity and reliability of the steps are supported by a comprehensive literature review, interviews with university leaders. Based on feedback and insights from interviews with leaders, the words of some items are slightly modified to adjust items to the Kopertis Region X situation and condition. To measure strategic costing, Aksoylu and Aykan (2013) with 9 point Likert-type 5 scale questions 5- points ranging from "strongly disagree" (1) to "strongly agree" (5) is adopted. Competitive advantage is measured by seven items, adapted from porter (1985) 5 on a 5-point Likert-type scale question starting from "strongly disagree "(1) to" strongly agree "(5). Furthermore, to measure the performance of universities, we adapted from Loddy 2014 with a 6-point Likert scale question ranging from "strongly disagree" (1) to "strongly agree" (5). All multi-item scales are reported.

#### 3.4. Data Analysis

The focus of this research is to examine the effect of competitive advantage on the relationship between strategic costing and university performance. Tests carried out include direct testing and indirect testing for each variable.

##### 3.4.1. Direct Effect Test

The direct effect test is intended to test the relationship between strategic costing and university performance.

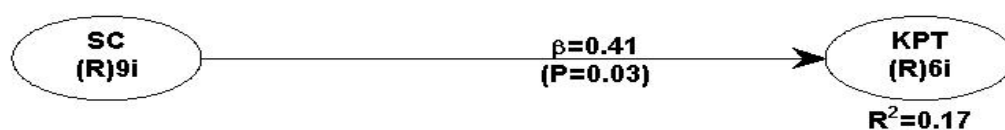


Figure 1 : Direct relationship model of strategic costing and university performance

In Figure 1 the resulting path coefficient is positive that is equal to 0.41 with p-value less than 5%. This means that SC has a significant positive effect on KPT, namely the better the SC, the better the KPT. Therefore, the H1 hypothesis is accepted. Meanwhile, the value of the Effect Size produced is 0.17 which indicates that SC has an influence on KPT which means that SC has a role to increase KPT. The magnitude of the effect of SC on KPT can be seen from the value of Rsquared Coefficients that is equal to 0.17 which means that the influence of SC on KPT is 17%.

### 3.4.2. Indirect Effect Test

The indirect effect test is intended to test the relationship between strategic costing and university performance through mediating variables of competitive advantage

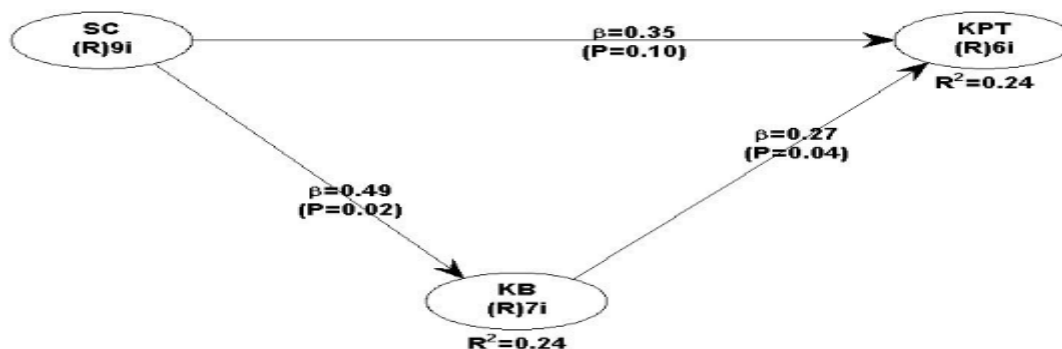


Figure 2 : Competitive advantage mediates the relationship of strategic costing with university performance

The indirect effect model shown in Figure 2 shows that the direct effect of strategic costing on university performance is statistically p-value greater than 5% with the path coefficient value decreasing to 0.35. From the identification of these three pathways, competitive advantage (KB) mediates simultaneously the relationship between costing strategies (SC) and university performance (KPT). This is because the significant mediation pathway is competitive advantage and the relationship of costing strategies to university performance is insignificant. Next, testing the mediation effect for the hypothesis is proposed in this study. If one mediating variable relationship or both is not significant, then it is said not as a mediating variable (Solimun, 2011; Hair et al., 2010; Kock, 2010, 2011, 2014).

The hypothesis in this study is that strategic costing affects the performance of higher education that is mediated by competitive advantage. The mediating effect of competitive advantage on the relationship of strategic costing (SC) with higher education performance (KPT) statistically at the 5% significance level can be seen from the following path:

- (a) Strategic costing (SC) affects competitive advantage (KB) and is statistically significant at the 5% level with a coefficient of 0.49.
- (b) Competitive advantage (KB) affects the performance of university (KPT) statistically at a significance level of 5% with a coefficient of 0.27

Therefore the hypothesis of H1 and H3 is accepted.

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# Method of Calculating the Value of Retribution and Engineering of Waste Transport in Waste Management Effort in the City of Pekanbaru

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**Abstract.** Waste is one of the problems in national and local studies. In this case, comprehensive and integrated waste management is needed from upstream to downstream to provide economic benefits while at the same time healthy for the community and safe for the environment. This study aims to get the model calculation retribution by using the model of investment theory and survey demand involving the community in determining the value of garbage retribution in the city of Pekanbaru. The research method used is a combination of quantitative and qualitative methods. Determining transport engineering in waste management refers to SNI 3242:2008 on waste management in settlements and calculation of economic benefits from waste management using waste calculation method and waste transport engineering method. The results revealed that the cost of waste levy required for Zone 1 including Tampan, Payung Sekaki, and Marpoyan Damai sub-district is Rp. 202,232.68 / ton of garbage, while those for zone 2 including Sukajadi, Senapelan, Pekanbaru, Lima Puluh, Sail, Bukit Raya, and Tenayan Raya sub-district is Rp. 213,587.94 / ton of garbage. The method of waste management engineering in Pekanbaru City includes waste collection, waste collection pattern and waste transport method with zone division consisting of priority zone and cooperation service zone.

## 1. Introduction

Since 2010, Pekanbaru has become the third city that has the most population on the island of Sumatra, after Medan and Palembang. The rapid pace of economic growth in Pekanbaru has contributed to the rate of population growth in this city. The increase in population is also accompanied by an increase in activities carried out, potentially increasing the amount of waste produced. This condition encourages the city government to look for waste management solutions that are environmentally friendly. The amount of waste generated by Pekanbaru City reaches 500 tons / day where every single person in Pekanbaru City produces up to 2.6 kilograms of waste per day (Pekanbaru Sanitation Agency, 2018).

Waste is the residual product that is no longer consumed, and waste that is formed continuously and accumulates can have a negative impact on individuals, society and the environment. Therefore, waste management is a necessity that cannot be delayed because every day the waste generated / produced by living things and the natural process continues to increase. However, waste management conditions, especially in the city of Pekanbaru, are still based on the rules set by the government without conducting a demand survey from the community, especially those related to the payment of waste retribution. Location of waste generation in the city of Pekanbaru is spread over various criteria for generation sources, including: residential areas, offices, markets, inns, restaurants, entertainment venues, tourist attractions, shopping centers, public facilities, hospitals, industries, and shophouses. Waste generation from each generation source produces different volume and characteristics of waste. This needs to be

studied more deeply to see the potential retribution and other economic potential that can be obtained from the potential volume and characteristics of existing waste generation.

With the enactment of Law Number 18 of 2008 concerning Waste Management and elaborated among others by Government Regulation No. 81 of 2012 concerning Household Waste Management and Household-like Waste, the waste management policy for more than three decades only relies on the transport-gathering approach (end of pipe) by relying on the existence of a landfill. It is changed with the approach to reduce resources and recycle resources through the implementation of 3R (Reduce, Reuse, and Recycle). The application of 3R is expected to be one form of waste management by changing the method of processing waste. Through the sorting and utilization of organic waste program, it is possible that only organic and recycled waste is feasible to be disposed of in the landfill. This process can save landfill land and the life of the landfill can be extended. This waste reuse process can create economic benefits in waste management that can be measured by using an analysis of economic benefits. All levels of society are expected to change their views and treat waste as an alternative resource whenever possible to be used again.

In addition, in order to realize the city of Pekanbaru free from waste, of course, it requires a method of engineering waste management and also a method of calculating the value of waste retribution based on community demand surveys. In the waste management method [1, 2] it is done by managing the waste transport system that is adjusted to the garbage collection system that is carried out communally with a garbage cart. From the results of the analysis and calculation, many equipments / landfills, collection equipments, garbage transport vehicles and landfill are needed. That is why, the appropriate method is a controlled disposal method, with the equipment of 1 (one) bulldozer. In addition, the transport container system is more productive than the fixed container system in terms of personnel and waste transported per ritation [3].

The method of calculating the value of waste retribution based on demand surveys [4,5] in price fixing is closely related to the amount of demand, transportation, differences in community income levels and social status of the community. So the solution in determining the price of a retribution that is rational is based on the characteristics of the household through a survey. There are still many obstacles regarding the implementation of the garbage retribution policy which impacts on solid waste handling services. It can be seen in which solid waste services are still not optimal, because of the limited availability of the budget [6,7]. It is also about the calculation of waste retribution by knowing the dependence of the value of willingness to pay by the community [8].

## 2. Methods

In studying about the method of waste management engineering and also the method of calculating the value of waste retribution based on community demand surveys, a more in-depth discussion is needed on the two methods.

### 2.1. Calculation of Waste Productivity

#### 2.1.1. Projection of Landfill

In order to project the landfill for the next 10 years, the method of generation rate of waste per year can be used with an increase of 0.02 ltr / person / day.

$$\text{Midden} = \text{total population} \times \text{rate of waste generation} \quad (1)$$

Determination of the size of the volume weight is closely related to the type of transport that is used and the strength of the road body that is followed. In planning, it is necessary to know the production of waste for the future. Estimates of waste production for the coming year must be in accordance with the level of activity and production productivity and income per capita.

### 2.1.2. Projection of Population Development

The increasing number of population and housing will have an impact on the level of production of waste that will keep increasing. The Pekanbaru City Government in anticipating the landfill and handling it in the next few years needs to calculate the population in order to calculate the projected landfill. This calculation uses geometry methods and exponential growth (Sembiring, 1995):

$$\text{Geometry growth: } P_n = P_o (1 - r)^n \quad (2)$$

where  $P_n$  is the population number,  $P_o$  is the initial population,  $r$  is the annual population growth rate,  $n$  is the period of time in a year.

$$\text{Exponential growth: } P_n = P_o X e^n \quad (3)$$

where  $e$  = a number of 2,718282

Classification of waste management based on the existing residential environment is: 1 Neighborhood with a population of 150-250 people (30-50 houses); 1 Hamlet consists of 2500 people ( $\pm$  500 houses); 1 Urban Village consists of 30,000 people ( $\pm$  6000 houses) and 1 subdistrict consists of 120,000 people (National Standardization Agency: 2008).

### 2.2. Engineering Method of Waste Transport

Before the transport process is carried out, the garbage is collected first at the Temporary Disposal Site (TPS). The TPS classification consists of 1) TPS type 1: a place for transferring garbage from the collection tool to the garbage conveyor equipped with sorting rooms, warehouses, waste disposal sites equipped with contained foundation and land area of  $\pm$  10-50 m<sup>2</sup>. 2) TPS type II: a place for transferring waste from the collection equipment to the garbage transport equipment equipped with a 10 m<sup>2</sup> sorting room, composting of 200 m<sup>2</sup> organic waste, 50 m<sup>2</sup> warehouse, waste transfer place equipped with 60 m<sup>2</sup> container base and land area of  $\pm$  60-200 m<sup>2</sup>. 3) TPS type III: a place for transferring waste from collection equipment to garbage transport equipment equipped with 30 m<sup>2</sup> sorting room, composting of 800 m<sup>2</sup> organic waste, warehouse 100 m<sup>2</sup>, a place for transferring garbage equipped with a 60 m<sup>2</sup> container base and a land area of > 200 m<sup>2</sup> (National Standardization Agency: 2008).

Waste transport engineering method is used to calculate the amount of waste generation using SK SNI M-36-1991-03, about the average volume per neighborhood per day, the average weight per neighborhood per day and the weight percent of per-component waste.

$$\text{Waste Generation Volume} = \frac{V_s}{u} \quad (4)$$

$$\text{Solid Waste Generation} = \frac{B_s}{u} \quad (5)$$

where  $V_s$  is the volume of waste measured and  $u$  is the number of waste generating units.

The National Standardization Agency (2008) explained the calculation of waste transport engineering. To calculate the number of collection equipment (cart / garbage rickshaw / motorbike garbage / car tub) the capacity of 1 m<sup>3</sup> in the housing can use:

$$\frac{(\text{Amount of Organic Waste in (A+B+D)} + (\text{number of Ts in C}) + \% \text{ yard waste})}{Kk \times fp \times Rk} \quad (6)$$

To calculate the number of direct collection tools (Trucks), the formula is:

$$= \frac{(\text{Ts road}) + (\text{Ts Park}) / \text{Day}}{\text{Truck capacity} \times 1,2 \times \text{Ritation}} \quad (7)$$

To calculate the number of containers for housing needs, the formula used is as follows:

$$CP = \frac{(30 \text{ until } 40)\% \times \text{the number of } Ts}{\text{Container capacity} \times Fp \times Rk} \quad (8)$$

The formula to calculate the number of containers for commercial needs and public facilities is:

$$CPN = \frac{\text{The number of } Ts \text{ in (Commercial area+Public facility)}}{KC \times Fp \times Ritation} \quad (9)$$

Where A is the number of luxury houses, B is the number of medium houses, C is the number of modest houses, D is the number of people in the flats, Kk is the capacity of the collecting device, Fp is the factor of solidification of the tool = 1.2, Rk is the ritation of the collecting device, Ts is waste generation.

### 2.3. Waste Calculation Retribution Method

Determination of waste retribution cost uses investment cost theory as follows:

$$\text{Investment cost} = \text{Land and Building Cost} + \text{Main Equipment} + \text{Supporting Equipment} \quad (10)$$

## 3. Result and discussion

### 3.1. Method of Engineering Waste Management in the City of Pekanbaru

Waste management is related to the activities of handling waste generation problems and managing vehicle needs in the process of transporting waste. Garbage generation can be obtained by sampling (estimation) based on available standards. This waste generation can be calculated using a unit of weight (kg / o / day; kg / m<sup>2</sup> / day; kg / bed / day and so on) and volume unit (L / o / day; L / m<sup>2</sup> / day; L / bed / days and so on). However, the use of volume units can cause errors in interpretation because there are compaction factors that must be taken into account. Forecasts of waste generation both now and in the future are the basis of planning, designing, and assessing solid waste management systems. The average estimate of solid waste generation is the first step that is usually done in solid waste management.

Waste management in the city of Pekanbaru continues to be pursued in order to create a clean and healthy environment. Garbage in the city of Pekanbaru comes from residential areas and non-residential areas. Settlements are part of the people residence who in the process of daily living activities becomes permanent contributors to the category of household waste. Likewise, in every sub-district in the city of Pekanbaru, the non-settlement area also becomes a contributor to waste which greatly affected the amount of waste generation in Pekanbaru City. Non-residential areas consist of hotels, banks, restaurants, tourist attractions, shops, education areas, health care providers, shopping centers, markets, and industrial areas.

Several studies provide the number of municipal solid waste generation in Indonesia ranging from 2-3 liters / person / day with a density of 200-300 kg / m<sup>3</sup> and the composition of organic waste 70-80%. Meanwhile, the amount of production / generation of waste per person in the city of Pekanbaru for each sub-district, the composition of waste produced in settlements consists of the composition of food waste, paper waste, yard waste, plastic, textile / fabric, rubber, wood, glass, metal, B3 (Hazardous and Toxic Materials) and other ingredients (diapers, stereofoms, etc). Analysis of residential waste generation is based on population in the planned year. The calculation of the population needs to consider the population growth rate each year to see the average population growth rate. The population of the city of Pekanbaru is always increasing according to the development of the city. This population growth rates are caused by birth and migration rates. The amount of migration is still greater than the birth rate. The projection of the amount of residential waste generation in the City of Pekanbaru for 2018 reveals that the sub-district which will be the largest producer of waste generation is Tampan District at 182,770



tons / day. Data collection of these settlements includes simple residential areas, middle settlements and luxurious settlements. Subsequently, the sub-district which is the biggest contributor to waste generation after the Tampan District is Tenayan Raya District. This sub-district contributes 95.422 tons / day of solid waste generation for simple, medium and luxury residential categories.

Next, the total generation of waste produced in Bukit Raya Subdistrict is 52,678 tons / day. In this sub-district, simple settlements produce waste amounting to 35,622 tons / day, intermediate area produces 6,045 tons / day of waste and the luxury area produces 11,011 tons / day of waste. Likewise, Marpoyan Damai Subdistrict produces waste with a total of 52,597 tons / day with details for simple residential areas producing waste of 37,608 tons / day, the middle area producing 6,268 tons / day of waste and the luxury area producing 8,721 tons / day of waste.

In addition to residential areas, non-residential areas are also a source of waste generation. The highest level of waste generation in the hospitality area is in Lima Puluh Subdistrict, which is 13.56 tons / day. The restaurant becomes the biggest contributor, namely in Marpoyan Damai Sub-district of 23.44 tons / day. The shopping area that makes up 12.43 tons / day of solid waste generation is in Payung Sekaki District. The education area consisting of elementary school, junior high school, senior high school / vocational school and university is the highest waste generation in Tampan Sub-district at 11.86 tons / day until 23.44 tons / day. The area providing health facilities consisting of intermediate hospitals, large hospitals, health centers or clinics and pharmacies that produce the largest waste generation is in Marpoyan Damai Sub-district of 8.40 tons / day.

The shopping center area produces the biggest waste generation, namely Senapelan District 19.28 tons / day. The market area produces waste which consists of large markets, medium markets, small markets and traditional markets, namely Tampan Sub-district at 12.84 tons / day. Payung Sekaki Subdistrict is an industrial area of solid waste generation with a volume of 4.27 tons / day. The projected solid waste generation in the city of Pekanbaru for 2019 is the largest in Tampan Sub-district at 209.46 tons / day and for 2020 at 245.71 tons / day. Marpoyan Damai Subdistrict in 2019 is 85.40 tons / day and in 2020 is 88.06 tons / day. It is estimated that in 2019 the sub-districts considered as the smallest waste generation contributors are Sail Sub-district, which is 22.24 tons / day and in 2020 is 23.21 tons / day.

Based on the generation of waste generated by each sub-district, it is necessary to carry out a technical analysis of waste transportation which includes the storage system, collection patterns and transportation methods. It can be done through the development of storage facilities by paying attention to cheap and practical storage, utilization of unused goods for storage, socialization of storage by sorting waste. Individual containers equipped with a lid and placed in an easily accessible place can be in the form of 10-40 liter plastic bags, easily lifted trash cans 40-60 liters and permanent trash cans. The collection process will run effectively if the TPS facility is available and making TPS at a low cost. Furthermore, the City Government carries out data collection and registration to both individuals and institutions that carry out garbage collection and can facilitate collection facilities for individuals or institutions working in garbage collection. Garbage collection vehicles can be in the form of garbage motorcycles, garbage carts or pickup cars.

In the method of transportation in waste management in the city of Pekanbaru, there is a division of waste transport zones, namely priority zones and service cooperation zones. Priority zones are closely related to the 2014 Pekanbaru City Solid Waste Master Plan report that has set priority zones. Determination of priority areas for solid waste services is done based on considerations including population density and population distribution, physical and social economic characteristics, generation and characteristics of waste, cultural attitudes and behavior of people, distance from waste sources to garbage landfills, urban spatial planning and development, means of collection, transportation and processing, available costs and willingness to pay local contributions and regulations. From the map of the distribution of buildings in the city of Pekanbaru, it can be seen that the priority of handling is the area with built areas that cover the entire area, namely all Mining Areas or Service Areas I, which include Subdistricts of Pekanbaru Kota, Senapelan, Sukajadi, Sail and Lima Puluh. In addition to

Region I, there are also other high priority areas that have high density, namely Tampan Urban Village and East Labuh Baru Urban Village in Payung Sekaki Subdistrict, Tangkerang Tengah Urban Village in Marpoyan Damai Subdistrict, Tangkerang Utara Urban Village and Tangkerang Timur Urban Village in Bukit Raya Subdistrict. The second priority scale is the Built Area which still has open space, namely the areas in the Subdistricts of Tampan, Bukit Raya and Marpoyan Damai. The third priority scale is the area with built land with a small percentage, namely the Subdistricts of Tenayan Raya, Rumbai and Rumbai Pesisir.

In the Cooperation Service Zone, the Pekanbaru City Government through the Pekanbaru City Environment and Hygiene Agency in 2018 divides the Waste Management Zone into 3 Zones. Zone 1 includes the Subdistricts of Tampan, Payung Sekaki, and Marpoyan Damai with an estimated population in 2018 totaling 554,376 people and an estimated amount of waste generation after 30% reduction reaches 339 tons per day. Zone 2 includes Subdistricts of Sukajadi, Senapelan, Pekanbaru Kota, Lima Puluh, Sail, Bukit Raya and Tenayan Raya with an estimated population of 2018,702 in 2018 and the estimated number of waste generation after the reduction reaches 349 Tons per day. Zone 3 covers Subdistricts of Rumbai and Rumbai Pesisir with an estimated population in 2018 reaching 146,156 people and an estimated amount of waste generation after 30% reduction reaches 54 tons per day.

The results of this study are in line with research from [2] analyzing transportation of waste transport supported by the transport container system and the productivity of waste management activities ranging from storage systems, garbage collection and garbage collection methods.

The pattern of solid waste services is carried out from the source of waste to the landfill in Muara Fajar. From the source of garbage collection, it is carried out using motorized vehicle carts and pickup cars. Herobak motorbike collects waste from the waste source to the TPS, while pickup collects waste from the waste source to Trans Depo. Garbage transportation is carried out from the waste source using a small size dump truck directly to the landfill. For TPS with container bin, transport is carried out using an arm roll truck. While large trucks are used to transport from Trans Depo to the landfill. This is in line with the results of research conducted by [1] which states that the waste transport system is adjusted to the garbage collection system that is carried out communally with a garbage cart. The transport container system is more productive than the fixed container system in terms of personnel and the transported waste per vehicle. From the results of the analysis and calculation, many equipments, collection equipments, garbage transport vehicles and landfills are needed.

Analysis of the number of vehicles is also a support in the waste management of the city of Pekanbaru. The vehicles used in the process of transporting waste include motorized tricycle vehicles, pick-ups, dump trucks, dump trucks / communal dump trucks, large dump trucks, large dump trucks, armrolls and becho loaders. Sub-districts that require the largest number of garbage transport vehicles in 2018 are Tampan, which requires 20 units of vehicles, followed by Payung Sekaki for 13 units and Marpoyan Damai for 12 units of garbage transport vehicles. From distribution of the number of vehicles based on the zone, it can be seen that zone 1 requires 45 units of vehicles and zone 2 requires 46 units of vehicles. Total garbage transport vehicles required for Pekanbaru City are 91 units in 2018.

### *3.2. Method of Calculating Waste Retribution Value in the City of Pekanbaru*

Analysis of vehicle operating costs in solid waste management includes the cost of analyzing vehicle rental, which is hourly operating costs. All costs will be converted based on prediction and summary analysis to be used in hours. Recapitulation of the analysis of operational costs per Subdistrict for 2018 can be seen as follows:

Based on the details of the recapitulation of the analysis of operational costs in 12 sub-districts in the City of Pekanbaru, the details of the operational costs are divided into two zones. The first zone includes the Subdistricts of Tampan, Payung Sekaki, and Marpoyan Damai. In the first zone, the cost per day is Rp. 65,612,722, - with a monthly fee of Rp. 1,968,381,663, while the need per year for zone 1 requires a fee of Rp. 23,948,643,577. In the second zone, it consists of Subdistricts of Sukajadi, Senapelan,

Pekanbaru Kota, Lima Puluh, Sail, Bukit Raya and Tenayan Raya. The need for vehicle operating costs per day is Rp. 70,532,929, - with a monthly fee of Rp. 2,115,987,877, while the need per year for zone 2 requires a fee of Rp. 25,744,519,180. The total demand for vehicle operating costs for these two zones is Rp. 49,693,162,758, -.

The method of calculating waste retribution value is mainly for two zones, zone 1 and zone 2. Zone 1 includes Subdistricts of Tampan, Payung Sekaki, and Marpoyan Damai while Zone 2 includes Subdistricts of Sukajadi, Senapelan, Pekanbaru Kota, Lima Puluh, Sail, Bukit Raya and Tenayan Raya. The total cost required for the two zones in the first year, 2018, is Rp. 52,726,100,447.39, while in 2019 the total cost required for both zones is Rp. 56,630,866,725.39. In the third year, 2020, the total cost required is Rp. 67,233,230,103.67. The total cost required for the three budget years is Rp. 197,249,217,004.10.

#### **Cost details for zone 1 which includes Subdistricts of Tampan, Payung Sekaki, and Marpoyan Damai from 2018 to 2020.**

Cost necessities are based on the transport contract. A waste transport contract is a unit price where payments are made based on the volume of waste transported each day which is accumulated every month or in accordance with the provisions stipulated in the implementation contract.

Payment for 3 years (Multy Years) a budget of Rp 96,785,402,830 is prepared, - which was paid in the amount of Rp. 25,518,201,117, - for payments in Fiscal Year of 2018 and Rp. 27,944,112,000, - for payments in Fiscal Year of 2019 and 34,524,416,727, - for payments in 2020.

Payments are made based on the tonnage of transported waste from Zone 1 to Muara Fajar Landfill at a price of: a) Payment of waste retribution from Zone 1 to Muara Fajar Landfill of Rp. 213,588, - per year in 2018; b) Payment of waste retribution from Zone 1 to Muara Fajar Landfill of Rp. 217,781 per ton in 2019; c) Payment of waste retribution from Zone 1 to Muara Fajar Landfill of Rp 219,203, - per ton in 2020. Whereas the ceiling of the provided funds is: 349 tons per day or 127,385 tons for 1 year in 2018, 361 ton per day or 131,723 tons for 1 year in 2019 and 372 tons per day or 135,651 tons for 1 year in 2020.

#### **Payment for Zone 2 which includes Subdistricts of Sukajadi, Senapelan, Pekanbaru Kota, Lima Puluh, Sail, Bukit Raya and Tenayan Raya.**

The breakdown of costs for waste retribution in zone 2 for three years, namely the period 2018 to 2020 (multy years), a budget of Rp. 97,463,814,174 is prepared, -. In the 2018 fiscal year, the total cost of this first year is Rp. 27,207,899,329, -. In 2019 the total need for waste retribution costs is Rp. 28,686,754,724, -. In 2020 the total cost required is 32,708,813,376.

Payments are made based on the tonnage of transported waste from Zone 2 to the Muara Fajar Landfill with Price; a) Payment of waste retribution from Zone 2 to Muara Fajar Landfill of Rp. 206,233, - per ton in 2018; b) Payment of waste retribution from Zone 2 to the Muara Fajar Landfill of Rp 208,006, - per ton in 2019; c) Payment of waste retribution from Zone 2 to Muara Fajar Landfill of Rp 209,396, - per ton in 2020.

#### **The budget ceiling provided for 349 tons per day or 127,385 tons for 1 year in 2018.**

In 2019 the budget ceiling is 361 tons per day or 131,733 tons for 1 year in 2019 and in 2020 the budget ceiling is 372 tons per day or 135,651 ton for 1 year in 2020. This research is in accordance with a research conducted by [4], [5,7,8]. The results of his research finding state that demand surveys in price fixing are closely related to the magnitude of demand, transportation, differences in community income levels and community social status. Therefore, the solution in determining the price of a retribution that is rational based on the characteristics of the household is through a survey. The implementation of the garbage retribution policy still faces a lot of obstacles which impact on solid waste handling services

which are still not optimal. This is because of the limited availability of the budget.

#### 4. Conclusion

Based on the results of the research on the method of calculating the value of retribution and engineering of garbage transport in solid waste management efforts in Pekanbaru, it can be concluded that the engineering method of solid waste management in the city of Pekanbaru includes waste storage, garbage collection patterns and methods of garbage transportation by dividing zones consisting of priority zones and cooperation service zones. The cost of waste collection needed for Zone 1 including Subdistricts of Tampan, Payung Sekaki and Marpoyan Damai is Rp. 206,232.68 / ton of waste, while for zone 2 including Subdistricts of Sukajadi, Senapelan, Pekanbaru Kota, Lima Puluh, Sail, Bukit Raya and Tenayan Raya is Rp. 213,587.94 / ton of garbage.

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# Strategic Development of National Tourism Strategic Area (NTSA) Pulau Rupert

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**Abstract.** Activities in the field of tourism are complex activities which include various sectors and forms of activities that have dynamic and growing elements. Based on Government Regulation Number 50 of 2011 concerning the Master Plan for National Tourism Development (RIPPARNAS) in 2010-2025, Rupert Island is designated as a tourist destination of Riau Province which has the potential to be developed because it has a very strategic position and very exotic selling points.

As the efforts to make Rupert Beach as a superior and excellent tourism area in Bengkalis Regency in particular and Riau Province in general, the community and government are required to maintain and develop the potential so that this tourist destination can sustain the acceleration of regional development. Therefore, a scientific study is needed to strategically develop the potential of Rupert Island NTSA. This study uses a SWOT analysis method that can answer the problem of research problem formulation.

This research is expected to add research references in the field of development planning, especially the development of areas that have the potential to be developed, and can improve the expertise and competence of researchers.

Based on the SWOT analysis, the strategy recommendations given are progressive, meaning that the development of Rupert NTSA is in a potential and steady condition so it is very possible to continue to expand, increase growth and achieve maximum progress.

## 1. Introduction

The current economic development of Riau Province has taken advantage of opportunities for regional income as a whole. Tourism is a very potential and strategic role to be developed because it functions as a development approach that is environmentally sound and as a regional economic balancer.

Based on this, the development of tourism will experience a process of physical and social change. The process of change continues along with the construction of infrastructure facilities, and other facilities or in other words, tourism planning begins with the development of regional tourism which includes the physical development of tourism objects.

Rupert Island, a National Tourism Strategic Area (NTSA) based on Government Regulation Number 50 of 2011 concerning the Master Plan for National Tourism Development (RIPPARNAS) in 2010-2025, is designated as a tourism destination in Riau Province which is very potential to be developed. Rupert Island consists of 2 sub-districts, namely Rupert and North Rupert. Rupert is one of the outer islands of Indonesia which is directly adjacent to Malaysia.

Activities in the tourism sector in Rupert Island are still complex-dynamic but tourism components (something to see, something to buy and something to do) along with the factors that influence tourism development have not been well integrated. In order to make Rupert Island a superior and excellent tourism area in Bengkalis Regency and Riau Province in general, the community and government are

required to maintain and develop their potential so that these tourist destinations can sustain the acceleration of regional development.

Based on the background of the problems described above, the research team was interested in developing a development strategy so as to provide anticipation for the problems faced by one of the strategic components of Riau Province regional development in general and Bengkalis Regency in particular namely Rupert Island NTSA.

## **2. Methods**

### *2.1. Method of SWOT (Strength, Weakness, Opportunity, Threat)*

SWOT is an analysis method developed by a scientist at the University of San Francisco (Wehrich) in the 1980s. This method can objectively and accurately analyze a problem. The four things discussed in this analysis are: Strength, Weakness, Opportunity, Threat. Overall, SWOT can be divided into two general parts of analysis; first (SW) is used to analyze internal conditions. Second, it is used to analyze external conditions (OT) (Zhang, 2012).

Through this SWOT method, researchers can find factors that determine the profit and the right strategy in developing Rupert Island NTSA and also can avoid the barrier factors and provide solutions to the strategy of developing Rupert Island NTSA.

### *2.2. Internal Factor Analysis System (IFAS)*

Internal strategy factor analysis can be carried out by compiling an IFAS (Internal Factor System Analysis) Table in order to make a more concrete assessment of regional or institutional strategic factors both in terms of Strength and Weaknesses. This assessment is very important to determine the main internal and external strategic factors (indicated by high scores) contained in the relevant area or institution. The main strategic factors will then be used as the basis for the formulation of the regional development strategy or the institution concerned using the SWOT Matrix (Sjafrizal, 2014).

### *3.2. External Factor Analysis Summary (EFAS)*

Analogous to the IFAS Table above, the preparation of the External Factor Analysis Summary Table (EFAS) can be prepared by knowing external strategic factors that are very important for the development of the region or institution concerned (Sjafrizal, 2014).

### *3.3. Strategy Formulation with SWOT Technique*

Formulation of strategies to achieve goals and objectives, it is necessary to create a SWOT Matrix using the results of the analysis of strategic factors. These strategic factors are those that have a relatively high value (score times weight) which includes Strength, Weaknesses, Opportunities and Threats. From the strategy, policies that are needed to support the implementation of the strategy will also be established.

In the First Quadrant, a strategy can be generated by connecting the element of strength with the element of opportunity. In other words, the strategy produced in this quadrant is basically obtained by utilizing the element of strength to seize the opportunities available. This strategy is commonly referred to as S-O Strategy and some even call it an Expansive Strategy (Growth Oriented Strategy).

The Second Quadrant can produce regional development strategies by linking the elements of strength with threats. In other words, the strategy produced in this quadrant is obtained by utilizing the power possessed by the region or institution concerned to reduce the threat that comes from outside. This strategy is also commonly referred to as the S-T Strategy which is more of a Defensive Strategy towards threats coming from outside.

**Table 1: SWOT Matrix Analysis for Strategy Formulation**

Internal  External	<b>STRENGTHS ( S )</b>  Determine 1-3 of the most strategic internal strength factors	<b>WEAKNESSES ( W )</b>  1. Determine 1-3 of the most strategic internal weaknesses
<i>OPPORTUNITIES ( O )</i>  2. Determine 1-3 external strategic factors that are very strategic	<i>STRATEGY S-O</i>  3. Determine strategies that use power to take advantage of opportunities	<i>STRATEGY W-O</i>  4. Determine strategies that minimize weaknesses to take advantage of opportunities
<i>THREAT ( T )</i>  5. Determine 1-3 very strategic external threat factors	<i>STRATEGY S-T</i>  6. Determine strategies that use power to overcome threats	<i>STRATEGY W-T</i>  7. Determine strategies that minimize weaknesses and avoid threats

In the Third Quadrant, regional development strategies can be generated by linking the elements of weakness with the opportunities available. In other words, in this quadrant a development strategy is created by overcoming the weaknesses that exist to seize the opportunities available. Therefore this strategy is commonly referred to as the W-O Strategy which is more of an internal policy adjustment.

In the Fourth Quadrant, regional development strategies can be produced by linking elements of weaknesses and threats. In other words, in this quadrant, development strategies can be created by overcoming existing internal weaknesses to reduce threats from outside. Therefore, this strategy is commonly referred to as the W-T Strategy which is more of a Self-Defense Strategy.

Each quadrant can produce one or more regional development strategies or the development of the relevant institution. In this case, there is no provision that requires each quadrant to have the same number of strategies, even one or two quadrants do not have a development strategy at all. The important thing to be done here is that the formulated regional development strategy does not overlap between one quadrant and the other quadrant. In addition, the strategy formulated must be truly appropriate and operational in accordance with the conditions of the region or institution concerned.

**3. Result and discussion**

Based on the results of the analysis of the description of each component, then processed in a SWOT matrix in which the application is how the power can take advantage of the opportunities that exist, and how to overcome weaknesses that can make threats become real or create a new threat, the development policy strategy RUPAT NTSA in Bengkalis Regency can be formulated through the following SWOT matrix chart;

**Table 2:** SWOT Analysis of NTSA Rupert

<b>Internal</b>	<b>8. Strength (S)</b>	<b>Weakness (W)</b>
	<b>9. • Has a variety of tourist attractions (natural, artificial, cultural / historical, special interests)</b>	<b>13. • There is no life guard facility</b>
<b>External</b>	<b>10. • Lodging and homestays are relatively affordable</b>	<b>14. • Tourism support facilities that are still minimal</b>
	<b>11. • Rural atmosphere that is still natural so it is very comfortable for refreshing</b>	<b>15. • Accessibility to roads to tourist areas is quite alarming</b>
	<b>12. • Friendly local culture</b>	<b>16. • There is no clear price benchmark for determining homestay fees</b>
		<b>17. • There are no souvenirs to buy</b>
		<b>18. • The lack of restaurants open until evening</b>
		<b>19. • Poor drainage system</b>
		<b>20. • Farm animals roam</b>
<b>Opportunity (O)</b>	Strategic SO	WO strategy
<b>21. • Located on the Malacca Strait which is an international shipping lane</b>	24. • Promotion of tourism to foreign countries	28. • Development of infrastructure supporting tourism
<b>22. • The kinship of local residents with residents in neighboring countries (Malaysia, Singapore, China) can increase promotion</b>	25. • Coordination with the Government and the Provincial Government in the division of Rupert NTSA development authority	29. • Provision of life guard facilities
<b>23. • Determination as an NTSA provides opportunities for development funding sources from the State Budget, Provincial and Regency Budget</b>	26. • Guidance and improvement of service capacity for lodging and homestay businesses	30. • Encourage investment in tourism development
	27. • Community empowerment in protecting the environment	31. • Development of restaurants
		32. • Provision of meal packages or restaurants at the inn
		33. • Community development in the production of souvenirs
		34. • Control and arrangement of community livestock
<b>35. Threat (T)</b>	39. ST Strategy	42. WT Strategy
<b>36. • Beach abrasion</b>	40. • Construction of wave retaining plots	43. • Construction of an integrated drainage system
<b>37. • Inundation due to high tide</b>	41. • Wave breaker construction	44. • Development and improvement of land, sea, air and ASDP accessibility and connectivity to reduce the price of goods
<b>38. • High infrastructure development costs in coastal areas</b>		

Source: Analisa, 2018

**Table 3:** Scoring of SWOT Analysis Results



<b>INTERNAL FACTOR</b>	<b>SCORE (S)</b>	<b>RATING (R)</b>	<b>S x R</b>
<b>1. STRENGTH</b>			
45. Has a variety of tourist attractions (natural, artificial, - cultural / historical, special interests)	0,3	4	1,2
46. Lodging and homestays are relatively affordable	0,2	3	0,6
47. Rural atmosphere that is still natural so it is very - comfortable for refreshing	0,3	4	1,2
48. Friendly local culture	0,2	3	0,6
Sub Total	1		3,6
<b>2. WEAKNESSES</b>			
- No life guard facility	0,1	2	0,2
49. Tourism support facilities are still minimal	0,2	4	0,8
50. Accessibility to roads to tourist areas is quite alarming	0,2	4	0,8
51. There is no clear price benchmark for determining - homestay fees	0,1	2	0,2
52. Souvenirs are not yet available for purchase	0,1	2	0,2
53. There is still a lack of restaurants open until evening	0,05	2	0,1
54. Poor drainage system	0,1	2	0,2
55. Farm animals roam	0,15	3	0,45
Sub Total	1	3	2,95
<b>Score of Internal Factor (Strength - Weakness)</b>			<b>0,65</b>

<b>EXTERNAL FACTOR</b>	<b>SCORE (B)</b>	<b>RATING (R)</b>	<b>S x R</b>
<b>1. OPPORTUNITIES</b>			
56. Located on the Malacca Strait which is an international - shipping lane	0,4	4	1,6
57. The kinship of local residents with residents in - neighboring countries (Malaysia, Singapore, China) can increase promotion	0,3	4	1,2
58. Determination as an NTSA provides opportunities for - development funding sources from the State Budget, Provincial and Regency Budget	0,3	3	0,9
Sub Total	1		3,7
<b>2. THREAT</b>			
- 59. Beach abrasion	0,3	3	0,9
- 60. Prone to inundation due to high tide	0,3	3	0,9
- 61. High infrastructure development costs in coastal areas	0,4	4	1,6
Sub Total	1		3,4
<b>Score External Factor (Opportunity - Threat)</b>			<b>0,3</b>

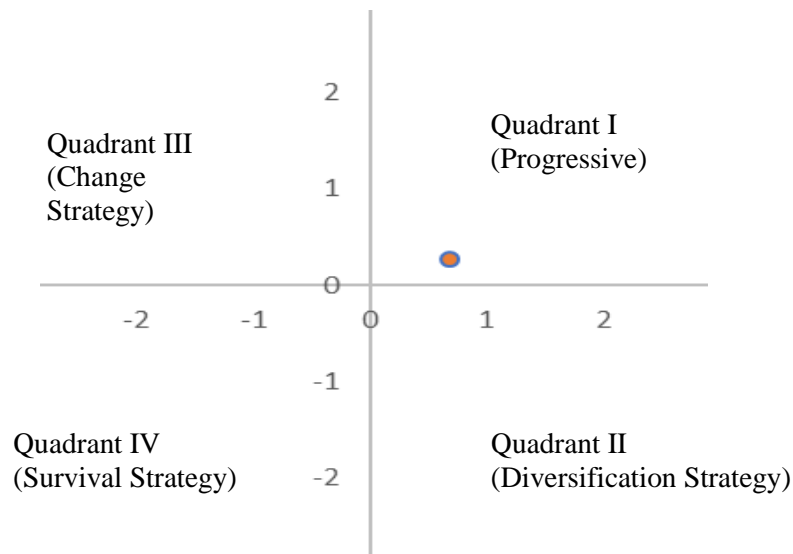


Figure. 1 Rupat NTSA Development Quadrant Strategy

From the results of the research, the meeting point is in quadrant I where this position signifies a strong and potential development potential. The recommended strategy is progressive, meaning that the development of the Rupat NTSA is in a potential and steady condition so it is very possible to continue to expand, increase growth and achieve maximum progress.

#### 4. Conclusions

Based on the SWOT analysis, the strategy recommendations given are progressive, meaning that the development of Rupat NTSA is in a potential and steady condition so it is very possible to continue to expand, increase growth and achieve maximum progress.

Accessibility is still not good in terms of telecommunications. Access to entry will be a negative value for tourism development. In this case the local government should continue to pay attention to the development of supporting infrastructure.

Management of economically sustainable tourism will contribute to local revenue (PAD). The involvement of local communities and the focus on empowering local communities will foster new jobs for the community and will automatically contribute to the regional economy. Based on this, the local government needs to pay attention to the development of existing tourism potential with professional management.

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# **An Analysis of Effect of Free Cash Flow And Profitability on Leverage Companies With Investment Opportunity Set As Variable Moderating on Trade, Services & Investment Sectors Listed on BEI**

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**Abstract.** The decline in the purchasing power of the public, as seen from the decline in the growth of Trade, Services and Investment sector in the retail sector subsector Retail sub-sector condition has been 2.5 years underperformance This study aims to test whether the influence of Investment Opportunity Set (IOS) free cash flow and profitability to leverage. Population in this research is Trade Company, Services & Investment, retail subsector, which is listed on BEI. period 2014-2016, ie as many as 23 Companies. Using the technique of purposive sampling, the sample in this study were 15 companies. Data analysis technique that is regression analysis by using moderating variable. From the test results, showed that the Free cash flow has a significant effect on leverage, which is indicated from the significance value  $> 0.05$  is 0.018. Profitability has a significant effect on firm leverage which is shown from significance value  $> 0.05$  ie 0.000. IOS does not affect the relationship between free cash flow and leverage, as indicated by the significance value of IOS interaction with free cash flow  $< 0.05$  is 0.053. And IOS Set affects the relationship between Profitability with leverage shown from the significance value of IOS interaction with Profitability  $> 0.05$  is 0.044.

## **1. Introduction**

Leverage is basically very necessary as a tool to measure how much the use of debt in a company. Leverage can be used as a reference for both companies and investors in the use of debt rather than equity. Measuring the number of assets to be financed by debt also uses leverage. The creditor finances the asset in the form of debt usage, while the debt used is not from investors or shareholders (Sudarmadji et al., 2007). In meeting the operational needs of an enterprise, some sources of funds come from debt, thus the company must fulfill its obligations in accordance to the agreement with the parties concerned. In paying off the debt, each company should see the level of leverage from a company.

Pecking Order Theory Myers and Majluf (1984) in (Hardiningsih & Octaviani, 2012) explain that a company determines the most preferred hierarchy of funding sources. This theory is based on the existence of asymmetric information, which is a situation where the management has a more information about the company than any capital owner. This asymmetric information will influence the choice between the use of internal funds or external funds as well as among the options of adding new debt or new equity issuance. According to Sunder and Myers (1992) in (Indahningrum & Handayani, 2009), in the simplest form, the pecking order model in the company's funding explains that when the internal cash flow situation is insufficient to fund real and dividend investment, companies will do debt issuance.

In 2017, the decline in public purchasing power is evident in the decreasing growth of Trade, Services and Investment sector, which is in the retail subsector. In the retail subsector, one can see minus growth, the sluggishness retail sales have been occurring since 2.5 years ago, the underperformance condition of the present retail industry subsector for 2.5 years, which makes the situation of retailers in Indonesia are in a slump. As for the impact it will have on the retail companies (retail trade), if the purchasing

power drops continuously, the retail industry will undergo decreasing sales, which is based on the data recorded at the National Development Planning Agency show that real retail sales growth of 16.3 percent in June 2016, dropped to 6.7 percent in June 2017. Meanwhile, the debt used in the company's operational activities continues to grow. This difficulty of companies experience in paying off debts, will lead to other impacts, e.g. investors' interest will be reduced (Liputan6, 2017).

Leverage, according to Brigham and Houston in his book entitled *Fundamentals of Financial Management* (2010: 140), is to what extent the company uses its funding through debt. According to (Gunawan et al, 2015) financing the assets of a company in order to run the operational activities of the company by using debt is the notion of leverage. According to (Dewi, 2012), leverage by ratio is between total liabilities to total assets. The higher the level of debt to a company, the higher the risks will be faced by the owner, where the owner will ask for the higher profits rate for the company providing it is not threatened to be liquidated.

Free cash flow is an actual cash flow which is distributed to investors when the company has made all necessary investments and capital to maintain the sustainability of a company's operations. Besides, the cash obtained from an operating activity minus capital expenditures is required to maintain the current level of operations. Therefore, the researcher shall identify the capital expenditures in the investment cash flows in relation to maintaining ongoing operations, including the ones in free cash flow (Suastawan, 2014).

Profitability is a company's ability to generate profits during certain periods. Profitability shows the proportion of earnings with assets or capital earning profits. Profitability describes the company's ability to earn profit through all capabilities, as well as the available resources such as cash, capital, sales activities, number of employees and branches, and others. Besides, profitability, i.e. the ability of the company in obtaining profit during a certain period, can be calculated through the sale / total assets / capital itself (Novelma, 2014)

Investment Opportunity Set that is part of the value of the company and is the result of choices in making future investment decisions. Moreover, Opportunity Set Investment is an opportunity in the form of a combination of assets owned and investment options in the future. The higher the opportunity of investment, the less the dividend to be, since it will be better if the fund placed in the investment that produces a positive NPV level (Natalia, 2013).

Several previous studies have examined leverage using moderating variables, e.g. the research conducted by (Kennedy, 2009) that examines the Influence of Dividends, Free Cash Flows, Firm Size, Profitability and Risk on Leverage Corporate with Investment Opportunity Set (IOS) As Variable Moderating. Their findings show that IOS does not affect the relationship between free cash flow leverage and corporate, but it strengthens the relationship between profitability and corporate leverage. However, (Masruroh et al, 2011) resulting in moderated regression analysis conclude that free cash flow affects the level of corporate leverage. From two studies conducted by (Kennedy, 2009) and (Masruroh et al, 2011) who find different results, there may be other factors that lead to the different results of the two researches.

### *1.1. Free Cash Flow on Leverage*

The existence of free cash flow for the company has the potential to create an agency conflict between shareholders and managers. Basically, shareholders prefer that the remaining funds to be distributed to them in the form of dividends. Whereas, in investing available funds, managers prefer to invest in more profitable projects in the hope of increasing incentives for them in the future. Jensen (1986) in (Fitriyah & Hidayat, 2006) argues that one solution to reducing agency costs arising from this agency conflict is by acquiring debt. With debt, the manager is motivated to work. Another research suggests that free cash flow as a description of the available cash after fulfilling all obligations or responsibilities, namely the need for payment to run an operating activity. Another opinion is that free cash flow reflects the available cash after the operating costs being deducted, both to increase working capital and operating assets maintenance (Suastawan, 2014).

In a research conducted by (Indahningrum & Handayani, 2009), they show that free cash flow affect the company's debt policy (leverage). Research about Free cash flow on debt is also done by (Nurwahyudi, 2004), which shows how free cash flow affects the debt (leverage).

H<sub>1</sub> : It is suspected that free cash flow has a positive and significant impact on leverage corporate.

### *1.2. Profitability to Leverage*

Profitability reflects earnings for investment funding. It advises managers to use pecking orders in funding decisions. Pecking Order is a sequence in the use of funds for investment i.e. profits are retained as the first option, and then it will be followed by the retaining of debt and equity. If it is true, the implication is that there is a negative relationship between profitability with debt ratio. The insider does not want to share the profits with the creditor so that there is a tendency towards a smaller company debt ratio (Indahningrum & Handayani, 2009). Based on the agency theory companies with high profitability value should utilize debt to reduce misuse of funds by managers who do not pay attention to shareholder needs. Companies that generate high profits will certainly make every shareholder propose share of profits in the form of dividend. Increasing profits will make them think that they have a big enough opportunity to be able to further develop their business. To meet the need for large investments, additional funds derived from debt are required.

In a study that was presented by (Suastawan, 2014), he shows that there is a significant influence between profitability variables on the company's debt policy (leverage). The research that was conducted (Indahningrum & Handayani, 2009) shows that profitability has an impact to the debt policy (Leverage). Research related to the influence of profitability to leverage also conducted by (Nabela, 2012), his research shows that profitability affect the debt policy.

H<sub>2</sub> : It is assumed that profitability has a negative and significant effect on company leverage

### *1.3. Investment Opportunity Set company as a moderator of Free Cash Flow relationship to Leverage.*

Jensen (1986) in (Kennedy, 2009) states that debt can reduce the flexibility of management in using free cash flow for activities with non-maximize value. With the debt, the manager must pay the principal and interest on the loan periodically and must comply with the terms of the debt agreement. Jensen also expresses the tendency of managers to waste on free cash flow is greater in companies with investment opportunity set low. Therefore, more oversight is required for companies having high free cash flow rates with investment opportunity sets low. However, according to Myres (1997) in (Masrurroh et al., 2007) firms with high investment opportunity set (IOS) indicate that the company value is determined more by intangible assets than real assets. The characteristic of this company is that it has limitations in getting the debt, because they lack the real assets that can be used as debt guarantees. In addition, high investment opportunity set (IOS) reflects the high risk as will be borne by each lender thus causing cost of debt for the company as well as the company's ability to get access to the lenders.

In a study put forward by (Kennedy, 2009) on the effect of Investing Opportunity Set (IOS) on the relationship between free cash flow and leverage corporate, it shows that IOS does not affect the relationship between free cash flow and leverage corporate. While the research conducted by (Masrurroh et al, 2011) shows that Investment Opportunity Set (IOS) is not.

H<sub>3</sub>: It is suspected that Investment Opportunity Set (IOS) has no effect on the relationship between Free cash flow with leverage corporate.

### *1.4. Investment Opportunity Set as a Moderate to Profitability Relationship with Leverage*

According to Amiruddin (2003) in (Kennedy, 2009) companies with high growth opportunities, the debt ratios are negatively correlated with firm value, because managers always have information advantages compared to outsiders. For market observers, the debt ratio can be viewed as a signal, potentially there is a negative correlation between debt and firm value when the company has a prospective growth opportunity. Anggria (2006) in (Kennedy, 2009) states profitability simultaneously significant effect on company leverage. This shows that the higher portion of funds available in financing the company's

operations and Investment Opportunity Set derived from retained earnings (earnings), the higher the level of corporate leverage.

In a study conducted by (Kennedy, 2009) on the effect of Investments Opportunity Set (IOS) on the relationship between profitability and corporate leverage, it shows that the Investment Opportunity Set (IOS) affects the strength of the relationship between profitability and corporate leverage. Meanwhile, research conducted by (Rahayu & Wirawan Yasa, 2018) show different results; it shows Investment Opportunity Set is unable to strengthen the negative impact of profitability on debt policy.

H<sub>4</sub>: It is suspected that Investments Opportunity Set (IOS) has a significant effect on the relationship between profitability and leverage corporate.

## 2. Research Method

This research is quantitative. Quantitative research is a method of research based on the philosophy of positivism, which is used to examine the population or certain samples, the data collection using research instruments, and the data analysis that is quantitative or statistical, which aims to test the hypothesis that has been established (Sugiyono, 2015 ). The object of this research is the Trade, Services and Investment sectors listed on the Indonesia Stock Exchange. The population in this study is all Trade, Services and Investment listed on Indonesia Stock Exchange which amounts to 98 companies in 2014-2016. Sampling technique is Sampling Purposive. From the technique, the research samples that meet the overall criteria of 15 retail companies. The data in this study are quantitative data sourced from secondary data in the form of financial statements of the sample companies published on the Indonesia Stock Exchange website [www.idx.co.id](http://www.idx.co.id)

### Variable Operational Definition

No	Variable	Defense	Measurement	Source
1	Debt Equity Ratio (DER)	Comparison between total debts with total assets (equity).	Debt Equity Ratio (DER) = $\frac{\text{Total Hutang}}{\text{total aset}}$	(Brigham & Houston, 2010)
2	Free Cash Flow	Reduced operating cash flows with net capital expenditures and net working capital	FCF = Operating cash flow - Investments in operating capital	(Brigham & Houston, 2010)
3	Return On Investment (ROI)	Comparison between profit after tax and total assets	ROI = $\frac{\text{Laba Setelah pajak}}{\text{total aset}}$	(Brigham & Houston, 2010)
4	Market to book value of equity (MVEBVE)	Pervandingan between outstanding shares outstanding multiplied closing share price with total equity	MVEBVE = $\frac{\text{Lembar Saham Beredar} \times \text{harga saham penutupan}}{\text{total ekuitas}}$	(Masruroh et al, 2011)

### 2.1. Data Analysis Technique

#### 1. Descriptive Statistical Analysis

Descriptive statistics are statistics that serve to describe or provide an overview on the object under study based on data samples or population as it should, without doing analysis and make conclusions that apply in general. In descriptive statistics, researchers put forward the ways of data presentation in the form of regular tables or frequency distribution, with graphs, pictograms and

circle diagrams (Sugiyono, 2015).

2. Classic Assumption Test

The classic assumption test conducted in this study consisted of three tests namely normality test to see whether the data used was normalized by looking at the test by Kolmogorov-Smirnov test with, multicollinearity test to see if there was correlation between independent variables by looking at the value tolerance and VIF values, and heteroscedasticity test to see if there was a variance inequality of one observation residual to another observation by looking at the significant value of alpha 0.05 (Ghozali, 2012)

3. Regression Analysis with Moderating Variables

Linear regression analysis by using the moderating variable was used to look at a relationship between a dependent variable (bound) with two or more independent variables (free) in stage I (one). While in phase II (two), linear analysis with moderating variable was used in seeing the influence of moderation in influencing the relationship between independent variable to dependent variable

The equation in this research was:

1. Regression Analysis Stage I

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + e$$

2. Regression Analysis Stage II

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 * Z + \beta_4 X_2 * Z$$

Where: Y = Leverage

A = Constant Number

$\beta_1$  = Coefficient Regression Free cash flow

$\beta_1$  = coefficient of regression Profitability

$X_1$  = Free cash flow

$X_2$  = Profitability

Z = Investment Opportunity Set (IOS)

4. Hypothesis Test

- test F (simultaneous) is an association test regression simultaneously from variable-dependent variable(dependent)which aims to do together all independent variables (independent) have a significant influence on the variable dependent
- T test, this test was used to see the effect of independent variable to partially dependent variable.
- The coefficient of determination was used to measure the extent of the ability of the independent variable (X) in explaining the dependent variable (Y). Adjusted R Square ( $R^2$ ), which is between the value of zero to the value one.

**3. Results And Discussion**

*3.1. Statistical analysis Descriptive*

Based on the analysis of the description of the variables that have been done, the characteristics used in the study were then displayed, which include: number of samples (N), the lowest value (minimum), the highest value(maximum), the value of the sample average (mean) and standard deviation on each variable.

**Table 1**  
**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Leverage (Y)	45	.01	9.55	.7584	1.47757
Free Cash Flow (X1)	45	-2.08	6.58	9.0242	1.61652
Profitability (X2)	45	-.68	.46	.0400	.16295
Investment Opportunity Set (Z)	45	-.60	243.25	9.0685	36.51224
Valid N (listwise)	45				

In the table above shows that the amount of data used in this study is as many as 45 samples, Lowest



value and highest value Leverage, Free Cash Flow, Profitability and Investment Opportunity Set can be seen in the table above. The average value of each variable and the standard deviation of each variable are also shown in Table 1.

3.2. Classic Assumption Test

3.2.1 Normality Test.

In detecting the data distributed normally or not normally data this study used One-Kolmogorov-Smirnov test. In making the decision of this normality test, the value of Asymp.Sig (2-tailed) was observed. If the value of Asymp.Sig (2-tailed) >  $\alpha = 0.05$ , then the data is normally distributed

**Table 2**  
**Normality Test Results**

	Standardized Residual	Description
Kolmogorov-Smirnov Z	1,095	Normally distributed data
Asymp. Sig. (2-tailed)	0.182	

Source: Data Processed

Table 2 shows One-Sample Kolmogorov-Smirnov test. The result of the test demonstrates the asymp. standardized residual sig was 0.182. It can be concluded that the significant value was greater than alpha 0.05 thus it indicates normal distributed data.

3.2.2. Multicollinearity Test

Detecting the presence or absence of multicollinearity symptoms in the regression model, can be done from observing the tolerance and variance inflation factor (VIF). The cut-off common value used to indicate the presence of multicollinearity was the value tolerance <0.10 or equal to the VIF value> 10 (Ghozali, 2012).

**Table 3**  
**Multikolinieritas Test Results**

No	Variable	Tolerance	VIF	Specification
1	Free Cash Flow (X1)	0807	1239	Did not happen Multicollinearity
2	Profitability (X2)	0807	1239	Did not happen Multicollinearity

Source: Processed Data

Based on Table 3 it can be concluded that the regression model was free from multicollinearity. This is evidenced by the values tolerance obtained for all the large independent variables of 0.10 and the VIF (variance inflation factor) value below 10. Where the variable Free cash flow shows that the tolerance value was  $0.807 > 0.10$ , the VIF value was  $1.239 < 10$ , Profitability shows that the tolerance value was  $0.807 > 0.10$  and the VIF value was  $1,239 < 10$

3.2.3. Heteroscedasticity Test

Heteroscedasticity test was performed to see if there was any uniformity of variance from residual one observation to other observation.

**Table 4**  
**Heteroskedasticity Test Results**

No	Variable	Alpha	Asymp.Sig	Description
1	Free Cash Flow (X1)	0.05	1,000	No Heteroscedasticity
2	Profitability (X2)	0.05	1,000	No Heteroscedasticity

Source: Processed Data

Based on the results of heteroscedasticity test, it can be seen in table 4 above shows that the value of Asymp. Sig on all independent variables were greater than alpha 0.05 so it can be concluded that all independent variables in this study did not experience heteroscedasticity.

3.3. Linear regression analysis with moderating variables

The linear regression analysis with moderating variable was used to look at the relationship between a dependent variable with two or more independent variables in phase I (one). While in phase II (two), linear analysis with moderating variable was used to see the effect of moderation in influencing the relationship between independent variable to dependent variable.

**Table 5**  
**Linear regression analysis with moderating variables Phase I**  
**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.815	.177		4.610	.000
Free Cash Flow	.289	.018		2,461	(X1)
Profitability (X2)	-.7347	1063	-.810	-6912	.000

Source: SPSS Data

Based on a linear regression analysis stage I obtained, the value of regression coefficient of free cash flow was 2.637 with positive parameters in which it can be concluded that any single-unit increase of free cash flow would result in the increase of coefficient value Leverage of 2.637. The Reitability Coefficient value of Profitability was -7.347 with negative parameters, which be concluded that each increase of one-unit Profitability would result in decrease of coefficient value Leverage equal to -7,347

Stage 2 (two) regression analysis was used to analyze influence of moderation. In this study regression analysis of the second stage was used to analyze the effect of Investment Opportunity Set moderation on the relationship between Free Cash Flow and profitability with company leverage. The technique used in multilevel regression analysis was Moderating Regression Analysis or MRA.

**Table 6**  
**Linear regression analysis with moderating variable Phase II**  
**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.689	.163		4.214	.000
Free Cash Flow	5,692.623	.000	(X1)	2,699	.010
Profitability	-9,150-1,009 -9,140	1,001		(X2)	.000
Interaction IOS * FCF	-.9183	.000	-.8652	- 1.990	.053
Interaction IOS * Profitability	.411	8,903.04		2,080	.856

a. Dependent Variable: Leverage (Y)

Source: SPSS Data

Based on the data analysis, the following equation was obtained:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_1 X_1 * Z + \beta_2 X_2 * Z$$

$$Y = 0.689 + 5.692X_1 - 9,150X_2 - 9.183X_1 * Z + 0.856 X_2 * Z$$

From the equation of moderating variable it is known that the interaction t value between Free Cash Flow to the Investment Opportunity Set of -1.990 with a significance value greater than 0,05 i.e. 0,053. It can be concluded that the variable Investment Opportunity Set did not affect the relationship between Free Cash Flow (X<sub>1</sub>) with leverage corporate. It is also known that t value interaction between Profitability with Investment Opportunity Set of 2.080 with small significance value of 0,05 was 0,044. It can be concluded that variables Investment Opportunity Set had a significant effect on the influence of Profitability with variable Leverage.

**Test f (Simultaneous Test)**

**Table 7**  
**F Test**  
**ANOVA<sup>b</sup>**

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	51 327	2	25 664	24 095	.000 <sup>a</sup>
Residual	44 734	42	1,065		
Total	96 062	44			

Source: SPSS Data

Based on Table 7 above, the amount of F obtained was 24.095, with a significance value used  $\alpha = 0.05$ . It can be concluded that the model used in this study was acceptable.

**Test t (Partial)**

**Table 8**  
**Statistical Test Results t**  
**Linear Regression Analysis Phase I and Phase II**

Variable	Phase I		Phase II	
	T	Sig.	t	Sig
(Constant)	4,610	0,000	4,214	0,000
Free Cash Flow (X <sub>1</sub> )	2,461	0,018	2,699	0,10
Profitability (X <sub>2</sub> )	-6,912	0,00	-9,140	0,000
IOS Interactions * FCF			-1,990	0,053
IOS Interactions * Profitability			2,080	0,044

Source: Data Processed

The results of the t statistical test (t test) on this research were as follows:

1. From t test on the variable Free Cash Flow (X<sub>1</sub>) was obtained  $t_{arithmetic} > t_{table}$ . i.e. the value of t arithmetic of  $2.461 > 2.01669$  with significant value 0.018. It was smaller than a significant level of 0.05 (5%). This shows that the variable Free Cash Flow (X<sub>1</sub>) had positive and significant effect to Leverage (Y). The result of this t test supported hypothesis 1 (H<sub>1</sub>).
2. T Test on the variable Profitability (X<sub>2</sub>)  $t_{arithmetic} > t_{table}$  was the value of t arithmetic -6.912  $< 2.0166$  with a significant value of 0.000. It was smaller than a significant level of 0.05 (5%). This shows that the variable Profitability (X<sub>2</sub>) had a negative and significant effect on variable Leverage (Y). The result of this t test supported hypothesis 2 (H<sub>2</sub>).
3. The moderating variable in this research was Investment Opportunity Set (Z) obtained  $t_{count} > t_{table}$  on interaction Investment Opportunity Set (Z) with Free Cash Flow (X<sub>1</sub>) that was equal to -1,990  $< 2.0166$  with significant value 0,053. It was bigger than significant level 0, 05 (5%). This indicates that the variable Investment Opportunity Set (Z) did not impact the influence of Free Cash Flow (X<sub>1</sub>) with variable Leverage (Y). This t test result supported hypothesis 3 (H<sub>3</sub>).

4. The moderating variable in this research was Investment Opportunity Set (Z) obtained by  $t_{count} > t_{table}$  on interaction Investment Opportunity Set (Z) with Profitability (X2)  $2,080 > 2,0166$  with significant value 0.044. It was smaller than significant level 0,05 (5% ). This indicates that the variable of Investment Opportunity Set (Z) affect the strength and was significant to the influence of Profitability (X2) with variable Leverage (Y). This t test result supported hypothesis 4 (H<sub>4</sub>).

**Test R<sup>2</sup> (Coefficient of Determination)**

**Table 9**  
**Test R<sup>2</sup>**  
**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.731 <sup>a</sup>	.534	.512	1.03204

a. Predictors: (Constant), Profitability (X2), Free Cash Flow (X1)

Source: SPSS Data

Based on the results of the determination coefficient test, it can be seen that the Adjusted R Square value was 0,512. This shows the variability of the dependent variable explained by the independent variable of 51.2% or 51.2%. It means that the levels leverage were influenced by Free cash flow (X<sub>1</sub>), and profitability (X<sub>2</sub>), while the remaining 48.8% was influenced by other variables not investigated in this study such as Managerial Ownership, Institutional Ownership, Dividend and Growth of the Company.

**4. Discussion**

Based on the testing of hypotheses by testing the regression equation the result can be obtained as follows:

1. Effect of Free Cash Flow to Leverage

The results of the hypothesis testing conducted on the hypothesis 1 indicate that the variable Free Cash Flow affected the leverage, which was seen from the significant value of 0.018. It was smaller than the significance level of 0.05 (5%). It can be concluded that Free Cash Flow was positively impact and was significant to the leverage. As the argument proposed by Junaidi (2012) in (Zuhria, 2016), the greater free cash flow, the lower debt policy of the company. It can be concluded that there was influence of free cash flow to leverage.

The results were consistent with the research by (Indahningrum & Hand, 2009) which examines the company Effect of Managerial Ownership, Institutional Ownership, Dividend, Growth Company, Free Cash Flow and Profitability of the Company Debt Policy of the manufacturing and non-manufacturing companies. They did not include actively financial companies in IDX in which their research results show that Free Cash Flow has positive and significant impact on leverage. The results of this study were also consistent with studies conducted by (Nurwahyudi, 2004) which examines the influence of Free Cash Flow to Debt, in which their research results show that the free cash flow affect the debt.

2. Profitability influence on Leverage

The results of hypothesis testing has been done on the hypothesis 2 show that variables affect the profitability of leverage, which can be seen the significant value gained from the 0,000 that is equal to the significance level of 0.05 (5%). It can be concluded that the profitability of a significant negative effect on leverage.

According to the citation by Anggria (2006) in (Kennedy, 2009) conclude that if profitability increases, the proportion of debt (leverage) will decrease, where it can be concluded that the influence of profitability on Leverage. The results of this study in accordance with the research that has been done by (Suastawan, 2014) that examines Effect of free cash flow and profitability in the debt policy on real estate companies, in which the research results showed that significantly influence Leverage

Profitability. The results of this study were also consistent with studies conducted by (Nabela, 2012) that examines Effect of Institutional Ownership, Dividend Policy and Policy Against Debt Profitability On Property and Real Estate Company in Indonesia Stock Exchange, where the research results show that the profitability effect on debt policy.

### 3. Effect of Free Cash Flow to Leverage Investment Opportunity Set as moderating

The results of hypothesis testing conducted on the hypothesis 3 indicate that the variable Investment Opportunity Set did not affect the relationship with the Free Cash Flow Leverage variables. It can be seen from the significant value gained from interaction Investment Opportunity Set with Free Cash Flow amounting to 0,053 which is greater than the significance level of 0.05 (5%). It can be concluded that Investment Opportunity Set did not affect the influence of the Free Cash Flow with variable leverage.

Jensen (1986) in (Kennedy, 2009) state that debt management can reduce the flexibility to use free cash flow for non-maximize value activities. The debt causes the manager obligated to pay principal and interest on the loan periodically and should comply with the provisions of the loan agreement. Jensen also said the tendency of managers to waste on free cash flow greater in company investment opportunity set low. Therefore, more oversight needed against companies contained high levels of free cash flow with lower investment opportunity set. This research results were consistent with the results of the research done by (Masrurroh, 2011) that examined Moderating Effect Analysis Investment Opportunity Set with the Dividend Policy and Investment Opportunity Set Moderating the Free Cash Flow to the Leverage Levels Food and Beverage Companies Listed in the Stock Exchange, where the research results showed that Investment Opportunity Set no affect the relationship between Free Cash Flow with variable leverage. The results of this study were also consistent with studies conducted by (Kennedy, 2009) that examines Effect of Dividend, Free Cash Flow, Company Size, Profitability and Leverage Risks to the Company with the Investment Opportunity Set (IOS) As Moderating Variables in Manufacturing Companies listing on the Stock Exchange, where the research results showed that Investment Opportunity Set did not affect the influence of the Free Cash Flow with variable Leverage

### 4. Profitability influence on Leverage Investment Opportunity Set as moderating

The results of hypothesis testing conducted on the hypothesis 4 show that the variable Investment Opportunity Set strengthen and has significant effect on profitability with variable leverage effect. The significant value gained from the interaction between Investment Opportunity Set and profitability was 0,044, which was smaller than the significance level of 0.05 (5%). It can be concluded that Investment Opportunity Set strengthen and was significant to the influence of Profitability with Leverage variable.

Ismiyanti & Hanafi, (2004) also state that there is a negative relationship between profitability and debt. In accordance with the pecking order theory, the higher the profitability of the company resulted in the greater availability of internal funds used in investment. It makes use of debt. Rofniati, The results were consistent with the results of the research done by (Kennedy, 2009) that examines Effect of Dividend, Free Cash Flow, Company Size, Profitability and Leverage Risks to the Company with the Investment Opportunity Set (IOS) As Moderating Variables in Manufacturing Companies listing on the Stock Exchange, where the research results show that Investment Opportunity Set affected the relationship between the variables Leverage Profitability. Nevertheless, it was different from the results of research conducted by (Rahayu & Wirawan Yasa, 2018), which examines Investment Opportunity Set (IOS) As As moderating Effect of Managerial Ownership Against Profitability and Debt development policy. Their research results show that the Investment Opportunity Set was not able to amplify a negative effect on the profitability of the debt policy. In other words, Opportunity Set affected the relationship between the variables Leverage Profitability

## 5. Conclusion

From the results of hypothesis testing done on the analysis of Effect of Free Cash Flow and Profitability to Leverage Investment Opportunity Set For moderating variables , the following conclusions can be drawn:

1. Variable Free Cash Flow was positively and significantly impact the Leverage with sig 0.018 <0.05. The hypothesis was accepted because it supported the hypothesis 1 (H1) that Free Cash Flow has positive and significant impact on leverage.
2. Profitability variables had negative and significant impact on leverage with sig 0.000 <0.05. The hypothesis was accepted because it supported the hypothesis 2 (H2) that the profitability significantly has negative impact on the leverage.
3. Investment Opportunity Set variable did not affect the relationship of Free cash flow with Leverage variable with sig 0.053 > 0.05. The hypothesis was accepted because it supported the hypothesis 3 (H3) that Investment Opportunity Set did not have any impact on the relationship between free cash flow and the leverage.
4. Investment Opportunity Set variable has impact to strengthen and was significant on the relationship between profitability and variable Leverage with sig 0, 044 <0.05. The hypothesis was accepted because it supported the hypothesis 4 (H4) that the Investment Opportunity Set affects relations between profitability and the Leverage.

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# Jambi Ecotourism Development Model: Reviewed From Budget and Performance Commitment

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**Abstract.** Accountability for the performance of institutions both government and private institutions can be seen from the accountability of their performance starting from planning, formulating and implementing their duties and functions that are realized in the form of budgeting. The budget is a plan of activities to achieve goals and as a tool to assess performance. The use of the budget as a target for the implementation of various short-term and long-term planning programs is widely applied by several companies and organizations in Indonesia. The budget prepared by the organization has a role as a planning, because the budget contains the organization's financial plan in the future. Organizations need a budget to translate the entire strategy into short-term and long-term plans and goals (Hansen and Mowen, 2003). Beside of being the target of implementing the activity plan, the budget also has a role as the main tool for controlling each organization, a tool for coordinating, communicating, motivating, and evaluating achievement (Kenniss, 1979). Budget can also be said to be a managerial plan that expresses activities and related to organizational goals that embody a work plan in a certain period and a long-term plan.

This study aims to offer a new model that needs to be considered in decision making by institutions that is to build a research model of the lake's ecotourism potential development in terms of religiosity, budget, commitment and performance of the tourism and cultural services of Jambi. Furthermore, it can be applied in the long term for agency decision making in improving performance, where this development model has never existed before. This research is also expected to provide a long-term contribution by investigating the effect of religiosity on agency performance. The targeted findings in this study are where the results of this study are expected to assist in long-term decision making and for the drafters of the legislation/regulation, to be more careful in formulating long-term policies. From the results of tabulation of respondents' answers, it is known that religiosity, budget, commitment, and performance are the main factors that influence the potential for ecotourism development in Lake Sipin, Jambi City.

## 1. Introduction

Tourism development in a region will have a positive and negative impact. The impact will affect the physical condition and the socio-economic life of the population around the tourism object (Soekadijo, 2000). Tourism in developing countries is often considered not to bring significant economic benefits, both for the destination country and for the local community (Goodwin, 1996). This imbalance occurs because most large-scale tourism businesses are monopolized by big businessmen. This type of tourism business establishes certain standards for every aspect of its activities.



Community-based tourism is a tourism development approach that emphasizes local communities both directly involved and indirectly involved in the tourism industry (Goodwin, 1996). This is done by providing opportunities (access) in tourism management and development which lead to political empowerment through a more democratic life including the sharing of benefits from fairer tourism activities for local communities. This idea was delivered to criticize tourism development which often ignores the participation of local communities in tourist destinations. The concept of community based tourism is the basis of sustainable tourism development which emphasizes that society is no longer the object of development but as a determinant of development itself (Fandeli, 2002). Emphasis on traditional lifestyles is an important matter that must be considered, preparing for spontaneous interaction between the community and tourists or visitors to be able to provide understanding and knowledge of visitors about the environment and local culture in addition to giving a sense of pride to the local community.

In various regions, tourist destinations are built with a variety of approaches with the aim of being a tourist attraction that can attract as many domestic and foreign tourists as possible. So it is not wrong that the tourism sector is one sector that can reap quite a lot of foreign exchange. Formulation of Ecotourism by The International Ecotourism Society (TIES) in early 1990, as follows: "Ecotourism is a responsible nature tourism activity by maintaining the authenticity and sustainability of the environment and improving the welfare of the local population".

Related to the performance of the provincial and municipal culture and tourism offices, under the management of the cultural and tourism service, the province and city of Jambi have various tourist attractions, which need to be developed again. One of them is the Lake Sipin Ecotourism Object which is one of the tourism potentials of Jambi City.

Sipin Lake Area is located in Telanaipura District, precisely in Legok Village. Sipin Lake Region has a length of around 4,500 meters and an average width of about 300 meters with a depth of 2-6 meters. Lake Sipin has a strategic location in the center of Jambi City, adequate supporting infrastructure (roads), and sufficient land to be developed as a natural and artificial tourist area and also a unique of Melayu Jambi around Lake Sipin area (Jambi Seberang Kota). In addition, the potential of Lake Sipin is in the form of beautiful natural scenery with fairly calm water conditions and a long lake shape and encircling Sipin Island. Nature in along this lake still looks natural with overgrown bushes with lush trees.

Accountability for the performance of agencies both government and private institutions can be seen from the accountability of their performance starting from planning, formulating and implementing their duties and functions that are realized in the form of budgeting. The budget is a plan of activities to achieve goals and as a tool to assess the performance of managers. The use of the budget as a target for the implementation of various short-term and long-term planning programs is widely applied by several companies and organizations in Indonesia. The budget prepared by the organization or company has a role as a planning, because the budget contains the organization's financial plan in the future. Organizations need a budget to translate the entire strategy into short-term and long-term plans and goals (Hansen and Mowen, 2003). Beside of being the target of implementing the activity plan, the budget also has a role as the main tool for controlling each organization, a tool for coordinating, communicating, motivating, and evaluating achievement (Kennis, 1979). Budget can also be said to be a managerial plan that expresses activities and related to the goals that embody a work plan within a certain period based on a long-term plan.

In general, each institution needs a budget as an important component in order to survive and develop in a rapidly changing business environment. With budget participation expected performance will increase. When a goal is designed and agreed upon, the employee will internalize the goals set, and have a sense of personal responsibility to achieve them because they participate in the budgeting. The process of participation in budget preparation can provide subordinates with an opportunity to ask for an explanation of the superior about the task and the strategy for its completion, and understanding the knowledge related to the task that can improve performance. To make an effective budget, leaders need

to forecast future conditions and can be traced. Budget participation raises budget adequacy, and then affects performance (Nouri and Parker, 1998).

Performance is the ability to carry out responsibility for product quality, product quantity, product timeliness, new product development, personnel development, budget achievement, cost reduction (increasing income), and public affairs (Nouri and Parker, 1998). The results of research by Nouri and Parker, 1998 show the importance of budget participation to have an impact either directly or indirectly on performance. However, research on budget participation shows inconsistent results.

This happens because the relationship of budget participation with performance depends on situational factors or better known as Contingency Variables. Contingency approaches cause other variables to act as moderating variables or intervening variables (Brownell, 1982; Murray, 1990; Shields and Shields, 1998). Intervening variables that are thought to affect managerial performance are variables of organizational commitment and religiosity as moderating variables. Organizational commitment influences individual motivation to do something. Individuals who have organizational commitment will have a positive outlook and try to do the best for the organization so that budget slack can be avoided. Chong and Chong (2002) stated that the higher the level of budgetary participation of subordinates, the higher the level of commitment to budget targets. The higher level of commitment to budget targets can improve performance. The results of Chong and Chong (2002) showed that the commitment of budget targets as contingency factors mediating the relationship between budgeting participation and performance showed inconsistent results due to different sample factors and small analyzed data. In addition to organizational commitment, organizational justice is also thought to have an influence on performance.

Budget participation is the level of influence and involvement perceived by individuals in the budget planning process (Milani, 1975). The level of influence is a major factor in Milani's research to distinguish between participatory budgets and non-participatory budgets. Budgetary participation causes subordinate's respected attitude towards work and company. In this engagement, the leaders must know how much they have to achieve the target to be achieved, so that the leader arises a feeling of being valued, trusted, which results in a sense of satisfaction with his work. In doing work, performance is thought to have variables that can influence the attitude of leaders in preparing a budget. Therefore, research needs to be done to improve performance by looking at variables that can affect performance. In this study, researchers took the variable Religiosity and organizational commitment as variables that were thought to influence performance in the budget preparation process. Religiosity is a factor that influences ethical behavior as shown in the studies of Clark and Dawson (1996).

The purpose of this study is to develop a research model for lake ecotourism development in Sipin in terms of religiosity, budget, commitment and performance of the tourism and cultural services of the province and the city of Jambi..

## **2. Literature Review**

### *2.1 Hope Theory*

Hope theory was introduced by Victor Vroom since 1964 and later refined by Lawlee and Poreter in 1968. Vroom (1964) developed a motivation theory based on the types of choices people make to achieve goals based on internal needs. According to this theory, motivation is the result of an outcome that someone wants to achieve and the estimation concerned that his actions will lead to the results he wants. In other words, if someone really wants something and the road seems open to get it, the person concerned will try to get it.

Hope theory has three main assumptions, namely:

1. Every individual believes that even though he behaves in a certain way, he will get certain things called the results of hope.
2. Each result has a certain value or attraction called valence.
3. Every result is related to a perception of how difficult the results are. This is called business expectation. In simple terms it can be stated that according to the hope theory, if someone wants something and the hope of getting something is big enough, then the person concerned will be

very encouraged to get the thing he wants. Conversely, if the hope of getting what he wants is small, his motivation to strive will be low.

This hope theory explains the process experienced and the expectations of an individual to make choices. If individuals expect positive and desirable results, they will usually work hard to perform at the level they expect. Furthermore, motivation is the result of an outcome that is desired by a person and the relevant estimate that the action will lead to the desired outcome.

Strong organizational commitment in individuals will cause individuals to strive to achieve organizational goals and willingness to direct business on behalf of the organization to improve performance. Two important characteristics of organizational commitment are strong beliefs about the acceptance of organizational goals and values and a willingness to put in enough effort on behalf of the organization (Porter et al., 1974).

Based on the above arguments, hope theory is proposed to support the relationship of commitment variables to the performance of the tourism and culture service of the provincial and city of Jambi.

## *2.2. Performance*

Etymologically the performance comes from the basic word of perform. Performance has the equivalent of a word in English that is Performance which is interpreted as carrying out the usability or task. Meanwhile, in terms of terminology, some experts have expressed some opinions about performance. If performance is associated with performance as a noun, then the definition of performance or performance is the work that can be achieved by a person or group of people in a company in accordance with the authority and responsibility of each in an effort to achieve goals illegally, not against the law and not against morality and ethics.

## *2.3. Performance Measurement Model*

Measurement of performance needs to be done to find out whether during the performance there is a deviation from the predetermined plan, or whether the performance can be carried out according to the specified time schedule, or whether the performance results are achieved as expected. To do these measurements, it is necessary to be able to measure performance so that a performance measure is needed. Performance measurement can only be performed on real and measurable performance. Assessing the performance of an organization must have the reasons and objectives of the organization. There are two types of organizations namely private and non-private organizations, for the private organization the purpose of its formation is to produce goods for profit, then the size of its performance is how much it can produce (productivity) and how much profit can be achieved (economy).

While public organizations are still difficult to determine the appropriate performance criteria. When viewed from the main purpose and mission of the presence of a public organization is to fulfill and protect the public interest, then the performance of public organizations can be said to be successful if it is able to realize its mission in meeting these public interests and needs. Performance measurement is an important part of the management control process of both public and private organizations. However, because the nature and characteristics of public organizations differ from the private sector, there is a difference in the emphasis and orientation of performance measurement. The purpose of the work assessment in the public sector is to

- a. Know the level of achievement of organizational goals..
- b. Provide employee learning facilities.
- c. Improve the performance of the next period.
- d. Provide systematic consideration in making decisions to give rewards and punishments.
- e. Motivate employees
- f. Create public accountability.

Other performance measurement models measured by Christopher Pollit and Greet Bouckaert are input/output models. The model assumes that institutions or programs are built to meet certain socio-economic needs. Based on these needs, organizational or program objectives are prepared. Organizations or programs provide input (staff, buildings, resources), arrange activities to process these

inputs in a particular process to be output. The resulting output then interacts with the environment so as to provide certain results or called intermediate outcomes, and in the long run these results are transformed into impacts or final outcomes. In this model the performance appraisal parameter consists of relevance, efficiency, effectiveness and Utility and Sustainability (Keban, 2014: 224).

1. Relevance, which measures the relationship or relevance between needs and the objectives formulated. Whereas in the Big Dictionary of Bahasa Indonesia, relevance means the relationship, suitability or relevance relationship in the development of tourism potential, in this research are: measuring the suitability between the needs in tourism development and the results achieved by the Department of Tourism and Jambi culture.
2. Efficiency, namely the comparison between input and output. According to Sutawijaya, et al (2009: 53). Efficiency in the production concept is limited to seeing the technical and operational relationships in a production process, namely the conversion of inputs into output. In this study, the intended efficiency is comparing the willingness of funds (budget) with the increase in the construction of Lake Sipin Jambi. Comparing the availability of facilities and infrastructure by increasing the development of tourism potential.
3. Effectiveness, namely the level of suitability between results (Intermediate outcome) will be the effect (Final outcomes). According to Mahmudi, (2005: 92) Effectiveness is the relationship between output and purpose, the greater the contribution of output towards the achievement of goals, the more effective the organization, program or activity. In this approach, what assessed is the accuracy of results in accordance with expectations and plans or more popularly called effectiveness criteria. The parameters are what results and how much can be enjoyed by those who benefit, and how many can enjoy the results, when they are enjoyed and where to enjoy them.
4. Utility and Sustainability, used to measure usability and sustainability between needs and their impact. The sustainable program is a perspective on activities carried out systematically and planned in the framework of improving the welfare, quality of life and environment of humanity without reducing access and opportunities to future generations to enjoy and use them.

In this study, the assessed is Measuring the benefits of the development of tourism potential by the Department of Tourism and culture. In this case it is seen how the work plan matches the results and impacts. In this case, who feels the impact of the programs realized is people and tourists.

Measuring the sustainability of the development of Lake Sipin tourism potential carried out by the Department of Tourism and Culture. In this case the researcher measures the sustainability of the tourism and cultural program/performance in the development of tourism potential for the following years.

From some of these descriptions, it is clear that the purpose of the performance measurement model is to find out whether or not an organization is successful in carrying out its duties. In this study, researchers used a work measurement model by Christopher Pollit and Greet Bouckaert in Keban (2014: 224). Prior to the reform of the public sector, the performance was emphasized only on input control, compliance with standards and budget compliance, but after the reform in the public sector, the performance shifted towards measuring the outcome, benefits and impacts on the public.

#### *2.4. Ecotourism Development Concept*

One of the limitations regarding the understanding of the ecotourism development concept (eco tourism), is the latest part of the development of tourism in Indonesia, where the main side and material sold are the origin of natural conditions. Ecotourism development issues develop along with the following demands:

- a) The better understanding and appreciation of tourists (young tourists) on the protection and management of natural resources;
- b) Decreasing quality of the environment in several places both in cities and in rural areas, so that the existence of a natural and natural environment is something that is sought;
- c) The development of sports branches and out door activities that have used natural factors as a basis for these activities have been developed;

- d) The existence of global issues related to aspects of nature conservation, especially in tropical regions.

### *2.5. Related Tesearch*

In the scope of work, Nasir (2009) reports results that show a positive relationship with participation. Some of the weaknesses in budgeting participation included by Nasir (2009) who found pseudo participation, which seemed to participate, but in fact did not participate. False participation occurs when upper level managers hold total control over the budget preparation process and seek support from their subordinates' participation, by trying to get formal acceptance from subordinates over the budget, but not giving their subordinates the opportunity to argue or not seek input in preparing the budget..

Nouri and Parker (1998) analyzed organizational commitment in its influence on the relationship of budget participation and performance. The results of their research stated that organizational commitment and performance had a positive and significant relationship. The higher the commitment to the organization, the manager feels that he has the organization where he works so that the manager will produce better results and performance.

Budget participation can improve employee perceptions of justice, only a few studies in the accounting literature that examine the effect of budgetary participation on performance (Wentzel, 2002; Maiga and Jacobs, 2007).

Religiosity according to Glock and Strak is the level of one's conception of religion and the level of one's commitment to their religion. The level of conceptualization is the level of one's knowledge of their religion, while what is meant by the level of commitment is something that needs to be comprehensively understood, so that there are various ways for individuals to become religious.

In Islam, religiosity in its outline is reflected in the practice of the faith, sharia, and morals, or in other words: faith, Islam, and ihsan. If all the elements have been owned by someone, then he is a real religious person.

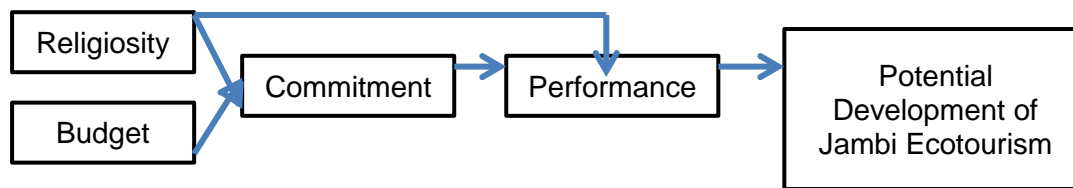
Based on the description, it can be concluded that religiosity is the depth of a person in believing in a religion accompanied by a level of knowledge of his religion which is manifested in the practice of religious values, namely by obeying the rules and carrying out obligations with the heart in daily life related to worship.

### **3. Materials And Methods**

This study uses qualitative methods to express symptoms holistically, research data obtained directly from the first party (primary) using survey techniques by distributing questionnaires sent directly. The population of the study is employees at the Provincial Culture and Tourism Office and Jambi City. The sampling method used in the study is non-probability sampling method, namely by using purposive sampling with the criteria of permanent employees, having worked for the tourism and culture department of Jambi City for 1 year and are involved in the budget preparation process and the Lake Sipin Ecotourism Development Team.

This research instrument uses closed question types. The research instrument uses a questionnaire of previous research, while the measurement of all indicators uses a Likert scale format of seven points from Strongly Disagree (1) to Strongly Agree (7). The stages in data processing used are data quality tests and statistical descriptions.

#### 4. Results And Discussions



#### Descriptive Statistics

The description of the answers in this study is explained by the results of statistical calculations using the SPSS program. The description of the respondent's answer about the measured research variables, namely Religiosity, Budget, Commitment and Performance are presented in the following table:

Table1 Description of Research Variables

Variable	Theoretical Range	Actual Range	Theoretical Average	Actual Average	Standard Deviation
Religiosity	4 - 28	4 - 28	16	18,1	5,37
Budget	4 - 28	6 - 28	16	18,3	4,76
Commitment	10 - 70	12 - 70	40	45,4	11,87
Performance	8 - 56	10 - 55	32	36,1	9,57

Source: Results of SPSS data processing

Religiosity is measured with 4 questions by using 7 Likert scale gradations, and from the results of reliability and validity testing shows that all statement items meet valid criteria. Based on the respondent's answers from the four items, the actual score range is between 4 - 28. The actual average score is 18.1 with a standard deviation of 5.37. This data illustrates that respondents' assessment of religiosity is relatively homogeneous. The actual average score is above the theoretical average of 16.

The budget is measured with 4 questions by using 7 Likert scale gradations, and from the results of reliability and validity testing shows that all statement items meet valid criteria. Based on the respondents' answers from the four items, the actual score range is between 4 - 28. The actual average score is 18.3 with a standard deviation of 4.76. This data illustrates that respondents' assessment of the budget is relatively homogeneous. The actual average score is above the theoretical average of 16.

Commitment is measured with 10 questions by using 7 Likert scale gradations, and from the results of reliability and validity testing shows that all statement items meet valid criteria. Based on the respondent's answer from the 10 points the question shows the actual scores range is between 12-70. The actual average score is 45.4 with a standard deviation of 11.87. This data illustrates that the respondents' assessment of the commitment is relatively homogeneous. The actual average score is above the theoretical average of 40.

Performance is measured with 8 questions by using 7 Likert scale gradations, and from the results of reliability and validity testing shows that all statement items meet valid criteria. Based on the respondent's answers from the 8 items, the question shows the actual scores range is between 10-55. The actual average score is 36.1 with a standard deviation of 9.57. This data illustrates that respondents' assessment of performance is relatively homogeneous. The actual average score is above the theoretical average of 32.

#### 4.1. Tourism Object Potential Analysis

As for the attractions that exist on Lake Sipin, has the potential to be developed in accordance with the attractions in Lake Sipin, that tourism objects that may be developed include: special tourism and accommodation, and general city recreation (natural tourism, historical tourism, and water recreation ). From the existing condition, it is maintained from influences that can damage its value. Whereas water and water sports attractions are more appropriate if developed in the Lake Sipin and Batanghari Rivers.

#### *4.2. Lake Sipin Tourism Facility Program*

The Lake Sipin Region will be developed into 3 forms of development, namely:

- Leisure tourism development activity group (Accommodation Center and Limited Recreation Center)
- Tourism recreation development group (City Public Recreation Center)
- Recreation activity groups complement tourism areas.
- Night tour (Angsa Night).

Based on the three groupings of tourism activity development mentioned above, tourism facilities for the Lake Sipin area can be arranged.

#### *4.3. Facility Program for Recreation Tourism Development Activities Group (City Public Recreation Center).*

a. Main Gate

It is a building with an open space that is equipped with the main gate leading to all activities in Pandan Island/Sipin (Lake Sipin).

b. Children's recreation

It is a park that enhances the children's fantasy world and increases children's love to love the environment. Facilities held here include: Children's playground.

c. Supporting Facilities

In addition to restaurants, complementary facilities will be provided on land, which are more dispersed. The facilities that will be directed to be provided here are:

- Mini grocery store.
- Souvenir shop.
- Workshop on regional art items.

d. Recreation of Tourism Car

A special means of transport with an open side tub, so that visitors can see/enjoy the scenery around the tourist area.

#### *4.4. Lake Sipin Area Facility Program for Recreation Tourism Development Activities Group (Limited Accommodation and Recreation Center).*

a. Open Theater

It is functioning to hold performance events such as traditional dances, musical performances or other events that are as a place to develop an art culture.

b. Art Building

This place is a building for closed art performances.

c. Multipurpose Building

It is a space facility for meeting activities both formal and non-formal as a support and facilities in the tourist area.

d. Lodges

This is an accommodation facility for tourists visiting Lake Sipin in the form of separate and stand-alone buildings and serves to enjoy natural and recreational scenery with the consideration that the visitor's "length of stay" estimate is more than one day.

e. Sky Jet

It is a water recreation facility that uses a type of water sky motorbike offered at Lake Sipin tourist object. This activity requires skills that are full of recreational challenges. This water recreation activity must be supported by special facilities that are accommodated in the sky jet pier area, because this activity requires special requirements that are very different from other water recreation.

f. Meeting Room (GSC).

This is a space facility for both formal and informal meeting activities as a support and lodging facilities (cottages).

#### 4.5. *Facilities Program for Complementary Activities for Tourism Areas*

- a. Restaurant  
Restaurants here specifically serve tourism development activities. The properties and restaurants here are more exclusive than other restaurants that will be planned on Lake Sipin.
- b. Floating Restaurant  
A restaurant building located on top of Lake Sipin, is a food and minimum infrastructure while enjoying natural scenery. This restaurant is general and open that allows all levels of society to come and enjoy it.
- c. Fish Market  
This market is a sale of fresh fish, can be bought and cooked directly on the spot according to the tastes of buyers where this market is traditional.
- d. Fishing Pond  
This place is adapted for those who like fishing, the choice of fishing location is north of Lake Sipin, a quiet area so that the atmosphere that is not natural and can be felt by fisherman in this location.
- e. Administration Building  
It is a technical control center for the administration of daily tourism activities equipped with:
  - Office space for control
  - Entrance ticket purchase space
  - Other supporting facilities.
- f. Service Building  
It is a building service center for Lake Sipin tourism area which consists of service buildings:
  - Health care center
  - Fire station
  - Security posts
  - Building tourism vehicle maintenance
- g. Dock Facilities  
This is a transportation facility for special visitors who will visit a group of tourism development activities.
- h. Road Facilities and Infrastructure  
The classification can be passed by motorized vehicles transporting visitors' goods and the services of lodging. Road facilities for visitors in the form of cars or passenger vehicles are opened to those who want but are prioritized for pedestrians.
- i. Active Recreation  
It is a water sports activity that is collective and social in nature with sports facilities such as canoeing, motorized boating, water bikes and others.
- j. Passive Recreation (Garden/Greening and Pathways)  
This is a facility in the form of parks and pedestrian which is processed in such a way that it creates a calm atmosphere and tourists can enjoy the natural scenery in this tourism area.
- k. Information Center  
It is a means by which tourists can easily find out what tour they want to go.
- l. Visitor Rest Room  
An open space facility or closed to rest for tourists visiting Lake Sipin tourism object.
- m. Souvenir and Memories Shop  
It is a place to sell souvenirs for tourists.

#### 5. Conclusions

From the results of tabulation of respondents' answers, it is known that religiosity, budget, commitment, and performance are the main factors that influence the potential for ecotourism development in Lake Sipin, Jambi City.



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# **The Role of Moderation of Organizational Commitment in The Relationship Between Government Accounting Standards, The Government's Internal Control System and The Quality of Government Apparatuses on The Quality of Central Government Financial Statements : Application of Governmental Accounting Standards In Indonesia**

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**Abstract.** This study is aimed to observe the factors that influence the application of governmental accounting standards in Indonesia based on indicators and variables that influence it. Quantitative descriptive method is used to reveal the holistic symptoms of the variables and population used in this study are all employees of the accounting/finance department of the Jakarta Climatology and Geophysics Meteorology Agency (BMKG) and UPT BMKG of Jambi Area which are numbered 99 people. In this study, the sample was taken using the census method. Data analysis procedure uses data quality test and statistical description. The findings from this study are that Governmental Accounting Standards, Government Internal Control Systems, Quality of Central Government Apparatus, Organizational Commitment, Central Government Financial Information Quality are the main factors influencing the application of governmental accounting standards in Indonesia.

**Keywords:** *Governmental Accounting Standards, Government Internal Control Systems, Quality of Central Government Apparatus, Organizational Commitment, Central Government Financial Information Quality*

## **1. Introduction**

One of the outputs of the data processing system (accounting system) is the financial information summarized in the Financial Statements. The financial statements have a function as a basis for consideration for organizational management in the decision making process. In other words, financial statements are as one of the information used in decision making. Therefore, financial statements are a main feature of financial reporting. Financial reports are the main principle of communication for parties outside the organization (I Putu S. Sanjaya, 2005). In a broader framework, financial statements are part of the management accountability process to interested parties. In financial management, the government has reformed by issuing Law Number 17 of 2003 concerning State Finance which requires the form and content of accountability reports for the implementation of the State Budget (APBN) to be prepared and presented with the Government Accounting Standards set by Government Regulation. The

government also issued Law No. 33 of 2004 concerning Financial Balance between the Central and Regional Governments.

The form of the accountability report for central financial management for one fiscal year is in the form of the Central Government Financial Report (LKPP). The Central Government's financial statements must follow the Government Accounting Standards in accordance with Government Regulation No.71 of 2010. The purpose of the enactment of the Government Regulation is as a concrete effort to realize transparency and accountability in the management of state finances in the submission of government financial accountability reports that meet the principles on time and are compiled in accordance with government accounting standards that have been generally accepted. The quality of government financial reports is strongly influenced by compliance with accounting standards, the quality of government apparatus, and the support of the existing accounting system.

Then Government financial statements are submitted to the DPR and the general public after being audited by the Supreme Audit Agency (BPK). In accordance with Law Number 17 of 2003 concerning State Finance Article 30, paragraph (2) states that the President submits a draft of law on the accountability of APBN implementation to the DPR in the form of a financial report which includes the State Budget Realization Report, Balance Sheet, Cash Flow Statement, and Notes for Financial Statements, enclosing Financial Statements of State Companies and other entities.

*Government Accounting Standard Board – USA (1999) in Concepts Statement No.1 regarding Objectives of Financial Reporting* states that accountability is the basis of financial statements in government. Central government financial management must be carried out based on good governance, namely financial management that is carried out transparently and accountably, which allows users of financial statements to be able to access information about the results achieved in the administration of the central government.

Financial reports generated by the Central Government will be used by several interested parties as a basis for decision making. Therefore, the information contained in the Central Government Financial Report (LKPP) must be useful and in accordance with the needs of the user. According to Xu et al. (2003) states that information will be useful if the information can support decision making, and can be understood by users. Therefore, the Central Government in this case the Meteorology, Climatology and Geophysics Agency must pay attention to the information presented in the financial statements for the purposes of planning, controlling, and decision making. The accounting information contained in the Central Government's financial statements must fulfill several qualitative characteristics as required in Government Regulation No. 71 of 2010 concerning Government Accounting Standards.

If the information contained in the Central Government Financial Statements meets the criteria for qualitative characteristics of government financial statements as required by Government Regulation Number 71 of 2010, it means that the Central Government is able to realize transparency and accountability in central financial management. The information contained in the financial statements produced by the Central Government must be in accordance with the criteria for the value of information required by the legislation. If the contents contained in the financial statements are not in accordance with the laws and regulations, it will result in losses, potential fraud, occurrence of SAL (More budget balance or SIKPA/SILPA (remaining less/more budget financing), inefficiency, and ineffectiveness.

The Government's Internal Control System according to Government Regulation No. 60 of 2008 Article 2 paragraph 3 aims to provide adequate assurance for the achievement of effectiveness and efficiency in achieving the objectives of the implementation of the state government, the reliability of financial reporting, safeguarding state assets, and compliance with laws and regulations.

From the Examination of the Supreme Audit Agency (BPK) for 86 State Ministries/Institutions reported in LKPP in 2012, there were 12 cases of weaknesses in the Internal Control System (SPI) which included weaknesses in the Accounting Control and Reporting System, weaknesses in the control system for the implementation of income and expenditure budgets, and weakness of policy control systems and internal control criteria. The BPK also found and recorded non-compliance with statutory provisions, for example: direct grant income from 15 ministries/institutions totaling Rp.499.62 m is not reported to the State General Treasurer, Budgeting for Goods and Capital Expenditures in 41 Ministries/Institutions amounting to Rp. 624.93 M is not in accordance with the provisions, and there is a Use of Expenditures in 72 Ministries/Institutions that are not in accordance with the provisions and indicated that the state has a loss of Rp. 546.01 M. Sales that are not in accordance with the contract so that there are potentially uncollectible receivables amounting to Rp. 1.35 trillion, approval for payment of the 14<sup>th</sup> quota increase for IMF membership is approximately Rp. 38.18 trillion is not yet clear about the source of funding, and the management status of SKK Migas has not been established, and the payment of operational costs during 2012 amounted to Rp. 1.60 trillion not through the APBN mechanism (<http://www.bpk.go.id/lkpp>).

## 2. Literature Review

Government Accounting Standards regulate the presentation of general purpose financial statements in order to improve the comparability of financial statements both on budget, between periods, and between entities. The general purpose of financial statements is to meet the shared needs of most report users. In order to achieve these objectives, this standard establishes all considerations in the context of presenting financial statements, guidelines for financial statement structure, and minimum requirements for the contents of financial statements. The application of Government Accounting Standards despite experiencing many obstacles, but it has increased. Improving the quality of the financial statements in the form of Audit Results Reports by the BPK, LKPP opinion in 2012 is Fair with Exceptions or Qualified of Opinion. The number of Institutions Ministries that get WTP (Unqualified) opinion is increasing.

In the context of government implementation, through Government Regulation Number 60 of 2008 the government established an internal control system that must be implemented both at the central and regional levels. The internal control system is an integral process for actions and activities carried out continuously by the leadership and all employees to provide adequate assurance of the achievement of organizational goals through effective and efficient activities, reliability of financial reporting, safeguarding state assets, and compliance with laws and regulations. The internal control system is useful for controlling government activities in order to achieve effective, efficient, transparent and accountable state financial management.

To produce high quality financial reports, as well as meet the characteristics of the financial statements required human resources who are competent in government, financial, and even organizational accounting about governance. This is in line with the research of Zeyn (2011) which states that most of the civil servants in finance do not come from educational backgrounds that are in accordance with their position and do not fully understand accounting. Other research conducted by the BPK (Nazier, 2009), which provides empirical findings that

76.77% of financial management units within the central government and local government are filled by employees who do not have an educational background accounting as the basic knowledge needed in financial management.

A quality financial reporting process will not be held without system support and behavior from members of the organization, in this case is the Central Government Apparatus of the Meteorology, Climatology and Geophysics Agency of Jakarta and UPT BMKG in Jambi Region. The behavior of employees is shown by the organization's commitment to produce quality accountability reports. Employees with high continuance commitment will continue to be members in the organization because they have the need to become members of the organization (Meyer, 1997). Normative commitment describes the feeling of engagement to continue to be in the organization. Employees feel themselves must be in the organization (Meyer, 1997), this will result in a pressure in carrying out their duties.

### **3. Material And Methods**

The population used in this study is the entire staff of the accounting department/finance department of the Central BMKG of Jakarta and the UPT BMKG in Jambi Region, there is 99 people.

In this study, the sample was taken using the census method. Census method is a method in which the total population of the research is taken all as respondents/research subjects (Arikunto, 2008).

The selection of research samples is based on the consideration that the Central BMKG of Jakarta and UPT BMKG of Jambi Region are agencies that consolidate the financial statements of all Work Units in Indonesia and produce the final output in the form of Central Government Financial Statements (LKPP).

The preparation of questionnaires was carried out in the form of closed questions. In each question in the questionnaire, the response method used is Likert scale 1 to 5. Score 1, 2, 3, 4, and 5 represent the answer strongly disagree (STS), disagree (TS), Neutral (N), Agree (A), strongly agree (SS). As for the data processing used is a statistical description.

### **4. Result And Discussions**

#### *4.1. Analisis Deskriptif*

Based on the results of the respondents' answers to the distributed questionnaires can be described about the responses of respondents to the variables applying government accounting standards, the internal control system, the quality of government apparatus, organizational commitment and the quality of central government financial information by BMKG respondents in Jakarta Center and BMKG in Jambi Region can be explained as follows:

#### *a. Responses to the Application of Governmental Accounting Standards*

The following is a recap of respondents' answers to the variables applying governmental accounting standards:

**Table 1**  
**Descriptive Statistics of Variables Implementing Governmental Accounting Standards**

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
PenSAP1	92	3	5	4.42	.519
PenSAP2	92	3	5	4.18	.610
PenSAP3	92	3	5	4.47	.544
PenSAP4	92	3	5	4.23	.595
PenSAP5	92	2	5	4.17	.640
PenSAP6	92	2	5	3.80	.855
PenSAP7	92	1	5	3.98	.770
PenSAP8	92	2	5	4.15	.769
PenSAP9	92	1	5	3.99	.819
PenSAP10	92	1	5	3.66	.952
PenSAP11	92	2	5	4.11	.748
ToPenSAP	92	37	55	45.17	4.585
Valid N (listwise)	92				

*b. Primary data sources was processed in 2018*

Based on table 1 above can be seen for the maximum value of 5 and minimum value of 1 on some indicators of the independent variables of the application of governmental accounting standards. Indicator 1 recording assets has been supported with evidence according to the provisions of the lowest value is neutral 3 (neutral). This means that none of the respondents stated disagree or strongly disagree. Indicator 2 Capital has been supported with evidence in accordance with the provisions of the lowest value is neutral 3 (neutral). This means that none of the respondents stated disagree or strongly disagree. Indicator 3 The budget realization report has been supported by evidence in accordance with the provisions the lowest value is neutral 3 (neutral). This means that none of the respondents stated disagree or strongly disagree. Indicator 4 financial management has separated the function of duty and the responsibility, the lowest value is neutral 3 (neutral). This means that none of the respondents stated disagree or strongly disagree. Indicator 5 Financial managers have understood that financial administration in accordance with the lowest score is 2 (disagree). This means that according to respondents are not all employees understand financial administration in accordance with the applicable provisions. Indicator 6 Financial Manager with the lowest accounting education background is 2 (disagree). This means that financial managers at BMKG do not all have an accounting education background. Indicator 7 facilities and infrastructures in the financial management that are owned to have adequate the lowest score is 1 (strongly disagree). This means that according to respondents' perceptions, facilities and infrastructure in financial management have not been fully adequate. Indicators 8 and 9 in terms of the lowest score transparency are 1 (strongly disagree). This means that according to the respondent's perception, "Not all financial statements are presented openly (nothing is covered)". Indicators 10 and 11 in terms of the lowest score management are 1 (strongly disagree). This means that according to the respondents' perception that the existing budget cannot meet all expenditure budget needs, besides that, it can be described the answers of 92 respondents on the implementation of governmental accounting standards is good because the mean results or an average of 45.17: 11 = 4.10 higher than 4.

*c. Response to the Government Internal Control System*

The following is a recap of respondents' answers to the Government's Internal Control System:

**Table 2**

**Descriptive Statistics of Variables of Government Internal Control Systems**  
**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
SPIP1	92	2	5	4.04	.769
SPIP2	92	2	5	4.20	.667
SPIP3	92	2	5	3.96	.811
SPIP4	92	2	5	3.79	.846
SPIP5	92	2	5	3.76	.803
SPIP6	92	2	5	3.95	.652
SPIP7	92	2	5	4.21	.621
SPIP8	92	2	5	4.03	.654
SPIP9	92	2	5	3.92	.615
SPIP10	92	2	5	4.12	.660
SPIP11	92	2	5	3.43	.941
SPIP12	92	2	5	4.03	.687
SPIP13	92	1	5	3.55	1.009
SPIP14	92	2	5	4.18	.710
SPIP15	92	2	5	4.03	.670
ToSPIP	92	44	75	59.22	7.460
Valid N (listwise)	92				

*d. Primary data sources processed in 2018*

Based on table 2 above can be seen the indicator 1 enforcement of the lowest score ethics score with a score of 2 (disagree). This means that according to respondents' perceptions that not all apparatus know the written code of ethics, and get examples of ethical behavior from the leadership. Indicator 2 risk control has the lowest score 2 (disagree). This means that according to respondents' perceptions, not all financial apparatus understand the measurement of risk to risk management and the determination of limits and determination of risk tolerance. Indicator 3 the separation of duties and positions has the lowest score 2 (disagree). This means that according to respondents' perceptions, not all financial apparatus feel that there is a function of segregation of duties and positions. This can happen because the number of government apparatus is still lacking. Indicator 4 has the clearest authority and responsibility to have the lowest score 2 (disagree). This means that according to the respondent's perception that there is no need for a functioning system and helps to ensure that responsibility has actually been implemented. Indicator 5 controlling authorization has the lowest score 2 (disagree). This means that according to respondents' perceptions that all activities of the BMKG's financial apparatus have not been implemented accordingly and adequately. Indicator 6 information and communication has the lowest score 1 (strongly disagree). This is according to respondents that the information in the financial statements has been communicated to those who need it. Indicator 7 periodic supervision has the lowest score 2 (disagree). This is according to the respondent that there are some apparatus who do not approve if the supervision is carried out continuously and periodically. Maximum score of 5 for all indicators 1 through indicator 15, while the minimum value of 1 is obtained from the respondent's answer to question number 13. For some indicators of the independent variables can be described that the answers of 92 respondents to the Government Internal Control System are good because the mean or average results average of 59.22:  $15 \times 3.95$  greater than 3.

*e. Response to the Quality of Government Apparatus*

Here is a recap of respondents' answers to the Quality of Government Apparatus:

**Table 3**  
**Descriptive Statistics of Quality Variables of Government Apparatus**

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
KAPP1	92	1	5	3.03	1.063
KAPP2	92	2	5	3.26	.936
KAPP3	92	2	5	3.00	.902
KAPP4	92	1	5	3.24	1.073
KAPP5	92	1	5	2.59	1.071
ToKAPP	92	10	25	15.15	3.649
Valid N (listwise)	92				

f. Primary data sources processed in 2018

Based on table 3 above obtained answers from respondents for indicator 1 about the placement of employees not supported by the appropriate educational background having the lowest score 1 (strongly disagree). This is because most of the placement of employees in BMKG's financial management section is in accordance with their educational background. Indicator 2 readiness of employees in facing a change has the lowest score 2 (disagree) on this answer according to the perception of the respondent of the existing employee who has understood the work assignment. Indicator 3 for employee competency has the lowest score 2 (disagree) to this answer according to the respondent's perception that the existing employee is ready to make changes to the process of preparing financial reports. Indicator 4 has the lowest score of 1 (strongly disagree). This is because according to some respondents employees have understood the contents of Government Regulation No. 71 of 2010 concerning Government Accounting Standards. Indicator 5 some respondents choose score 1 (strongly disagree) this is that the BMKG work unit has capable human resources. So from the table a minimum score of 1 and a maximum score of 5, for some of these indicators can be illustrated that the answers of 92 respondents to the variable Quality of Government Apparatus are good because the mean or average of  $15.15 : 5 = 3.03$  is greater than 3.

g. *Response to Organizational Commitment*

Berikut adalah rekap jawaban responden terhadap Komitmen Organisasi.

**Table 4**  
**Descriptive Statistics of Organizational Commitment Variables**

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
KO1	92	2	5	4.17	.689
KO2	92	2	5	3.99	.777
KO3	92	2	5	4.12	.724
KO4	92	3	5	4.16	.579
KO5	92	1	5	3.67	.951
KO6	92	1	5	3.33	.951
KO7	92	2	5	3.79	.778
KO8	92	1	5	3.74	.810
KO9	92	2	5	3.95	.685
KO10	92	2	5	3.77	.813
ToKO	92	26	50	38.70	5.334
Valid N (listwise)	92				

h. Primary data sources processed in 2018



Based on Table 4 above for item 1, most respondents agree that they feel that they have an organization where they work. Item of question 2, most respondents agreed that they felt emotionally bound to the BMKG organization where they worked. Item of question 3, Most respondents agree that the organization they work for is very meaningful. Item of question 4, most respondents agree that they feel they are part of the organization they work for. Item of question 5, most respondents agree that the problems that occur in the workplace are like part of their problem. Item of question 6, the average respondent chooses an answers of score 3 (neutral), that is difficult to be bound by other organizations as like the organization in which they work. Item of question 7, most respondents strongly agree that they want to try hard to succeed the institution where they work. Item of question 8, some respondents strongly agree that employees remain in the agency because of their commitment to the organization. Item of question 9, most of the respondents strongly agreed that the reason they remained in the agency was due to the form of loyalty to the institution where they worked. Item of question 10, most respondents agree that they feel they have no commitment when leaving the organization where they work. The above answers can be seen for the maximum value of 5 for all indicators 1 through indicator 10, while the minimum value of 1 is obtained from the respondents' answers for indicators number 5, 6, and 8, and for some of these indicators can be described that the answers of 92 respondents for the Organizational Commitment variable is good, because the mean or average of  $38.70 : 10 = 3.87$  is greater than 3.

*i. Response to BMKG Financial Information Quality*

Here is a recap of respondents' answers to BMKG Financial Information Quality:

**Table 5**  
**Descriptive Statistics of Financial Information Quality Variables of BMKG**

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
KLKPP1	92	3	5	4.22	.488
KLKPP2	92	2	5	4.27	.537
KLKPP3	92	2	5	4.30	.569
KLKPP4	92	3	5	4.36	.505
KLKPP5	92	3	5	4.35	.523
KLKPP6	92	1	5	4.30	.642
KLKPP7	92	2	5	4.28	.599
KLKPP8	92	3	5	4.16	.498
KLKPP9	92	2	5	4.12	.724
KLKPP10	92	2	5	4.16	.651
KLKPP11	92	2	5	4.04	.678
KLKPP12	92	2	5	4.20	.579
KLKPP13	92	2	5	4.08	.597
ToKLKP	92	41	65	54.85	5.231
Valid N (listwise)	92				

*j. Primary data sources processed in 2018*

Based on table 5 above can be seen for item of question 1, most respondents answered agree to financial report information giving users the opportunity to evaluate the achievement of goals. Item of Question 2, most respondents answered agree that financial information was presented on time according to the needs in decision making. Item of question 3, most respondents answered agree that financial information is presented on time as needed in decision making. Item of question 4, most respondents

answered agree that the financial statements in the Budget Realization Report are presented in full. Item of question 5, most respondents answered agree that the notes to the financial statements are presented in full. Item of question 6, most respondents answered agree that the financial statements in the balance sheet are presented in full. Item of question 7, most respondents answered agree that the financial statements were presented honestly. Item of question 8, most respondents answered that the financial statement information could be tested for fairness. Item of question 9, most of the respondents answered that they agree that the financial statement information was not in favor of the needs of certain parties. Item of question 10, most respondents answered agree that their financial statements could be compared with the previous period report. Item of question 11, most of the respondents answered that the financial statements could be compared with other financial reports within the BMKG. Item of question 12, most respondents answered agree that financial report information can be understood by its users. Item of question 13, most respondents answered agree that financial statement information is presented in forms and terms that are in accordance with the user's understanding limits. Maximum score of 5 for all indicators 1 through indicator 13, while the minimum value of 1 is obtained from the respondent's answer for indicator 6, and for some of these indicators can be described that the answers of 92 respondents to the Central Government Financial Information Quality variable are good because the mean or average results in the amount of 54.85:  $13 = 4.22$  is greater than 4.

## 5. Conclusions

From the tabulation of respondents' answers, it is known that Government Accounting Standards, Government Internal Control System, Quality of Central Government Apparatus, Organizational Commitment, Central Government Financial Information Quality are the main factors influencing the application of governmental accounting standards in Indonesia.

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# Impact of Social Commerce Characteristics on Consumer Trust on Online Shop In Instagram

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**Abstract.** This study aims to determine the influence of social commerce characteristics consisting of reputation, quality of information, transaction security, communication, economic feasibility, references word of mouth and brand image to consumer confidence in online shop in Instagram. The type of this research is quantitative descriptive with causal research design. The population in this study is the entire community who ever made an online purchase in Instagram. The sample used was 175 respondents, using purposive sampling technique. The results showed that the variable reputation, communication, references word of mouth and brand image affect the consumer confidence. While the variable of information quality and economy feasibility do not have an effect on consumer trust

**Keywords:** Social Commerce, Reputation, Information Quality, Transaction Security, Economic Feasibility, Word of Mouth Reference, and Brand Image.

## 1. Introduction

The digital world is increasingly favored by all ages. Modern society already understood the importance of technology. They use technology as a means of information seeking, communication and commerce. The technology used can already connect to the internet. Now the internet has become the need of every human being. Straubhaar et al (2011) stated that the internet plays a role in the globalization of communication because with the ease given by the internet, has helped the public in obtaining information, both domestically and abroad. The increase of population every year, will also increase the number of Internet users. In early 2014 the number of internet users in Indonesia reached 88 million while in 2016 reached 132.7 million people (APJII, 2016). This proves that it is true, internet usage in Indonesia has increased quite rapidly. Within 2 years alone could have increased as many as 44.7 million people internet users. Moreover, the people of Indonesia have been able to perform various activities in a virtual, such as seeking information, email, active social media and others.

Internet users as much as 63.5% make purchases of goods or services online (APJII, 2016). This indicates the transition of consumer behavior that initially made a purchase in the offline store, is now beginning to switch to online store (Manganari et al, 2011). In addition, other virtual activities undertaken by the people of Indonesia are active in social media as much as 97.4 percent (APJII, 2016). This shows that social networking sites are also frequently used. The site also varied, ranging from Facebook, Instagram, Twitter, Youtube and others. From various social networking sites used by Internet users, Facebook is reaching the highest position but Instagram is also not lost. If sorted from the top 3 positions of Facebook occupy the top position, Instagram second position and Youtube occupy the third position.

Judging from the number of users of social networking sites, business people can take advantage of this condition to start marketing products or services online. Kim & Park (2013) states that s-commerce is a blend of e-commerce with social networking sites to facilitate the sale and purchase of products and services using internet technology. However, the difference between s-commerce and e-commerce is that e-commerce focuses on maximizing efficiency with sophisticated search strategies, one-click purchases of goods, and recommendations based on past consumer spending activities.

S-commerce on the other hand, puts shopping goals in combination with social goals such as sharing information on social networking sites (Wang & Zhang, 2012). If online merchants are continuously exploiting s-commerce as a place to market their products, more and more are able to know their products, sales level will also increase, thus helping to increase economic growth.

According to Paquette (2013), online marketers and retailers can take advantage of social networking sites to reach consumers by offering new ways to shop. There are many social networking sites that can be used to market goods and services, one of them is Instagram. Instagram is used as the most interesting social media. Because if selling using online buyers only know the product in the form of visual only and Instagram application specialize its users to share photos or video. Not only that now Instagram has changed a lot.

Changes that occur on Instagram features that is, if the first Instagram can only divide the video with a duration of 15 seconds, now can be with a duration of 1 minute, filters for more photos, Instagram also has tools such as comment fields, like, tag others posted photos that have been uploaded, there are also hastag features to facilitate users search for information that has been filtered through hastag, then there is also a location feature, and the most recent feature Instagram live and Instagram stories that can be lost after 24 hours post.

Marketing of products through Instagram social networking is more profitable. Online merchants do not need to pay huge operational costs. No longer need to pay store rent, employee salaries, taxes and others. Instagram is also not a paid app. Online merchants who market their products through Instagram only need interesting photos with different hastags or taggers according to the product. If online merchants want their products to be known by more people, they can use advertising or sponsoring features. The cost is very cheap starting from Rp 13.000 alone can be a clear target market, ranging from gender, age, hobby, demographic and other geographical.

Kunto (2016) states that 71 percent of Instagram users in Indonesia access their owned Instagram accounts have spare time, and 12 percent do so at least 1 time per hour. Instagram users in Indonesia are quite large, as many as 32 percent of the total population of Indonesia or about 80 million users (Wijaya, 2016). The large number of Instagram users is a boon for online merchants on the site, it is easier to market their products or services, and it is easier to make prospective customers feel overwhelmed to buy the products or services they offer. The eMarketer survey (2016) also showed that about 52 percent of Instagram users follow a variety of digital retailer accounts or also called online shop.

Business through s-commerce in Instagram becomes an opportunity for online merchants, because they can get more customers. However, the growing technology and the internet are also knowledge owned by the traders, they will also use Instagram as a marketing medium. Therefore, online merchants who use Instagram site if they want to continue to grow they must follow the changing behavior of consumers and also implement marketing strategies for the long term. One that can be done is to identify and understand the desires of consumers.

Problems often experienced by consumers related to online shopping is about trust (Freischald, 2015). Consumers who shop on social networking sites tend to have a hesitate to make a purchase, because consumers do not have a guarantee that the online shop is trustworthy. Moreover, the rise of online shop fraud in Instagram lately. From the results of research Kaspersky Lab and B2B International there are 26% of Indonesian consumers experience fraud online. In fact, according to research results Kaspersky Lab and B2B International states that Indonesia became the country with the largest victims of fraud (Tempo.co, 2016). Kim & Park (2013) states online payment system is still manually check, which is different from the system in most e-commerce that has been using the automatic check system that increasingly adds doubt for consumers to buy and transact in the online shop. So consumers who believe in e-commerce is not necessarily believe in s-commerce. If in e-commerce consumers who have not received the goods can cancel the transaction and the money they spend can still be withdrawn.

Therefore, online merchants in s-commerce need to pay attention to this issue. Online merchants should convince their customers that their online shop can be trusted.

Ie and Denny (2013) declare that online trust as a trust of a certain party to another in conducting transaction based on a belief that the person he trusted will fulfill all his / her duty well as expected. Good corporate reputation gains the trust of consumers, not only that a good reputation can also reduce the perception of risk when they make an assessment of a company's product or performance. So, it allows more customers to trust the company that has a good reputation.

From the collapse developed by Kim & Park (2013) makes people start believing to make online purchases. In addition, online purchases also make it easier for people to shop. Online retailers have an opportunity to continue to grow and innovate if they find solutions or strategies that address consumer complaints, including those related to anxiety or uncertainty caused by consumer distrust (Jarvenpaa et al 2000 in Kim & Park, 2013). There are several characteristics of s-commerce that are considered to affect consumer confidence, namely reputation, quality information, security transaction, communication, economic feasibility, references word of mouth, and brand image.

Reputation is defined as the extent to which consumers believe that companies are honest and care about customers (Doney & Cannon, 1997). Rayner (2003) stated that the company's reputation is a collection of past and present perceptions and beliefs that are based on the company's stakeholders. Reputation is indicated as one of the key factors to build consumer confidence in the context of online shopping. Therefore, a good reputation is an intangible asset for online retailers. In previous research. In addition Ashari (2017) also stated in his research that the influence of reputable and famous online shop reputation will not cause consumer confidence in the online shop. In a previous study, Pratriwi (2011) found that there was no significant influence between the company's reputation on the level of consumer confidence in online transactions. In addition Ashari (2017) also stated in his research that the influence of reputable and famous online shop reputation will not cause consumer confidence in the online shop.

Quality information refers to the latest, accurate and complete information provided to the users of s-commerce (Kim & Park, 2013). The information in question may be information related to the product or service described in detail which aims to give the consumer a breakdown. Online shoppers rely heavily on the information displayed because they have limited resources on the products or services they want to buy. According Sutabri (2012), the quality of information depends on 3 things, namely accurate, timely, and relevant. The quality of information provided by the company to online shoppers will provide a good perception of the customer's mind if the information is accurate, timely and relevant so that customers will be more confident to the online shop. In previous research conducted by Ashari (2017) states that there is no significant influence between the quality of information with consumer confidence in Instagram. While research Kim & park (2013) states that the quality of information positively affects consumer confidence.

Kim & Park (2013) defines transaction security as a s-commerce user's trust that an s-commerce company provides security related transactions and transaction-related information. Trust in the online business environment itself has been done because the business environment is unpredictable and there is no face-to-face interaction between consumers and sellers (Doney & Cannon, 1997; Gefen, 2000; Jones & Leonard, 2008). The security of online transactions is not guaranteed by the business. Online shoppers need to be more selective in online shopping, though online transactions are still popular. According to research Ashari (2017) transaction security has no significant effect on consumer confidence. While research from Zamah (2016) states that transaction security has a positive effect on consumer confidence.

Marketing communications are a means by which companies seek to inform, persuade, and remind consumers directly or indirectly about products and brands sold (Kotler, 2008). Ashari research (2017) states a significant influence between communication to consumer confidence. Similarly, Kim & Park (2013) research also states that there is a significant influence between communication on consumer trust.

Economic feasibility refers to individual expectations that s-commerce provides an effective exchange of communication and information opportunities (Kim & Park, 2013). While Grewal et al (1998) and Monroe et al (1983) define economic feasibility as a value sacrificed by consumers to obtain certain products or services. The value in question is the monetary and non-monetary elements such as time spent when shopping and the emotional state of consumers when shopping. One factor that can increase the value in the eyes of consumers is the cheap price and discount (Anckar & D'Incau, 2002). Research Zamah (2016) & Ashari (2017) states economic feasibility positive effect on trust.

References WOM refers to online activities where consumers exchange information or experience to assist others in making purchasing decisions (Kim & Prabhakar, 2000; Park et al, 1998). While Hasan (2010) states WOM reference is a consumer action to provide information to other consumers in a non-commercial about a brand, product, or service. WOM is one of the best ways to get new buyers based on referrals from those consumers. Therefore, consumers are an important subject in promoting products or services on s-commerce through WOM reference. WOM is considered to be the most honest opinion of consumers who have experienced the product or service so that others will appreciate information of opinion and information of others rather than advertising when buying products or services (Park et al., 1998). Ashari Research (2017) which states the existence of a significant influence between the reference word of mouth to consumer confidence. While from research Zamah (2016) states that the reference word of mouth does not affect consumer confidence.

Kotler (2002) stated that brand image is a number of beliefs that consumers have with brands. In accordance with Kotler's (2002) statement that brand image is a number of beliefs held by consumers related to the brand, this is reinforced if the brand image is one factor buyers believe in the online shop even more so if the brand is well known to the public.

Based on the theory and previous research, a hypothesis of variables that can influence consumer confidence is characteristic of s-commerce characteristic consisting of reputation, quality of information, transaction security, communication, economic feasibility, references word of mouth and brand image. The purpose of this study is to determine the effect of s-commerce characteristics on consumer confidence. While the formulation of the problem is whether there is influence of characteristic variables s-commerce to consumer confidence.

## **2. Research Methods**

This research is a causal research and survey research conducted to consumers who make purchases at online shop in Instagram. Questionnaire with questions as many as 21 questions. The population used is all respondents who have made purchases on the online shop in Instagram. The sampling method used is non-probability sampling method with judgmental sampling category or commonly referred to as purposive sampling. In this method the respondents were selected based on the specific characteristics of the sample which were seen to have a close characteristic to the characteristics or properties of the previously known population (Santoso and Tjiptono, 2001). Characteristics of samples in this study are people who have bought goods or services online at least 2 times to 3 times because it is considered people who believe in the online shop. The next characteristic is the male or female society over the age of 17 years, because the answer given is considered capable to be accountable. In this study the sampling using multivariate analysis formula that requires 25 times the independent variable. Independent variable of this research is 7 variable, it means need 175 research sample.

Validity and reliability analysis is used to measure the measuring tool in the form of kuisiner. Multiple linear regression analysis is used to find out the influence of s-commerce characteristic to consumer's trust toward the purchase of goods online. F test and t test are used to test silmultan and partially influence of s-commerce characteristic to consumer trust toward purchasing of goods online.

## Results and Discussion

This analysis describes the profile picture as well as the demographics of the respondents on the overall data of the questionnaire. Respondents in this study with male gender amounted to 53 people and respondents with female gender amounted to 122 people. Respondents in this study aged between 17 years to 55 years. From the age criteria established by the researcher that is 17 years and over, indicates that the sample received does not reflect the whole of the population, because the number of respondents with the same age is uneven. Most respondents are at the age of 17 years as many as 32 respondents. Respondents with this type of work consisted of students, students, employees, and employees. The number of respondents is mostly in the students, because the possibility of students prefer to shop through online than other professions.

The result of validity test on reputation variable, information quality, transaction security, communication, economic feasibility, word of mouth reference and brand image indicate that all statements have significance value less than 0.05. So it can be concluded that all items of independent variable statement declared valid. Reliability test results show that all variables have cronbach's alpha above 0.6, so for the next items on each of these variables are feasible to be used as a measuring instrument and questionnaire otherwise reliable or reliable

A good regression equation model is one that meets the requirements of classical assumptions, including all normally distributed data, the model must be free of multicollinearity symptoms and free from heteroscedasticity. From the previous data analysis it has been proved that the equation model proposed in this study has met the requirements of the classical assumption so that the equation model in this research is considered good. The results that can be known in multiple linear regression equations are:

$$Y=0,115+0,140X_1+0,006X_2+0,064X_3+0,305X_4-0,064 X_5+0,240X_6+0,329X_7$$

**Table 1. Results Of Multiple Linear Regression Analysis**

No.	Variable	Regression Coefficient	Standard Error	t count	Significance
1	Constants	0,115	0,310	0,372	0,710
2	Reputation	0,140	0,048	2,906	0,004
3	Quality of Information	0,006	0,064	0,095	0,925
4	Transaction Security	0,064	0,071	0,909	0,365
5	Communication	0,305	0,074	4,122	0,000
6	Economic Feasibility	-0,064	0,047	-1,344	0,181
7	Word of Mouth reference	0,240	0,082	2,993	0,004
8	Brand Image	0,329	0,056	5,839	0,000

### 3. Discussion

#### 3.1 The Effect of Reputation To Consumer Trust

The results show that the reputation variable has a value of t arithmetic of 2.906 and the value of t table 1.6536, while the significance value of 0.004 is smaller than 0.05. From the calculation results can be concluded that the hypothesis that the reputation of the online shop in Instagram have an influence on consumer trust is accepted. The influence of reputation on consumer trust in online shop in Instagram in accordance with the opinion of Rayner (2003) which states that the company's reputation is a collection of past and present perceptions and beliefs that are based on the company's stakeholders. Reputation is indicated as one of the key factors to build consumer confidence in the context of online shopping. Therefore, a good reputation is an intangible asset for online merchants. These results are reinforced by research Kim & park (2013) which states that reputation affects consumer confidence. In addition, strengthened also with research Pratiwi

(2011) which states that there is a significant influence between the reputation of consumer confidence.

### *3.2 The Effect of Information Quality on Consumer Confidence*

The calculation results show that the significant level for the variable of information quality is 0.925 and greater than 0.05 while the value of t arithmetic (0.095) < t table (1.6536) which means that the hypothesis stating that the quality of information affects consumer confidence rejected. The result of hypothesis testing has proved there is no influence of information quality to consumer trust. This statistical test proves that the quality of information from online shop in Instagram has no influence on consumer trust. This shows that although the online shop in Instagram displays complete information for consumers, it does not make consumers believe in the online shop. This result is in contrast to previous research by Kim & Park (2013) that the quality of information has a positive effect on consumer confidence. Online shop that provides complete and useful information, it has not guaranteed the emergence of consumer confidence in the information provided. Consumers have limitations in processing information, so when making online purchases consumers will be more easily confused when faced with the many information about the product (Gao et al, 2012; Forbes et al, 2005). Therefore, the quality of information provided by the online shop should be displayed effectively because the information power of each consumer is different, so if the specific information between consumers will not conclude differently and assume the information provided can be trusted.

### *3.3. The Effect of Transaction Security on Consumer Confidence*

The result of the calculation that has been done shows that the significant level for the transaction security varabel is 0,365 which is bigger than 0,05, while the value of t arithmetic (0,909) < t table (1.6536). This indicates that the hypothesis is rejected which states that the security of the transaction affects consumer confidence rejected. The result of hypothesis testing has proved there is no effect of transaction security to consumer trust. The results prove that the security of transactions from online shop in Instagram has no effect on consumer trust. The results of this study support the Ashari (2013) study which states that the security of transaksi has no effect on consumer trust. The results of this study contrasted with the results of research from Kim & Park (2013). Differences in results can occur due to differences in research objects used. This research focuses on online shop at Instagram. Instagram is not a marketplace, so payment system security is still manually checked by each retailer, where there is no direct intervention from Instagram (Kavulla, 2014). The lack of transaction security in Instagram, makes consumers consider the transaction-related risks to their beliefs to shop online. Supported by Yoon (2002) asserting that transaction security not only measures the security of the payment system, it also considers the risks felt by consumers.

### *3.4. The Effect of Communication on Consumer Confidence*

The result of hypothesis testing has proved that there is influence of communication to consumer trust. From the calculation that has been done is obtained a significant level of 0.000 and smaller than 0.05 and t arithmetic (4.122) > t table (1.6536) which means that the hypothesis expressing the communication effect on consumer trust is accepted. This statistical test proves that communication from online shop in Instagram has influence to consumer trust. The better the communication given or delivered by the customer service online shop in Instagram, the higher the trust also owned by consumers. In accordance with the opinion of Morgan & Hunt (1994), accurate, credible and actual information submitted from the seller to the buyer will prevent bad communication and prevent loss of confidence from the consumer to the seller. Marketing communications are a means by which companies seek to inform, persuade, and remind consumers directly or indirectly about products and brands sold (Kotler, 2008). With the presence of corporate communications intensity with customers, the customer will be more easily believe because the online shop to provide the right information, persuasion provided by the online shop to customers will also be easier to accept. This result is also reinforced by Kim & Park (2013) study which states a significant influence between communication on



consumer trust. Ashari's research (2017) also states a significant influence between communication on consumer trust.

### *3.5. The Effect of Economic Feasibility to Consumer Confidence*

The result of hypothesis testing has proved that there is influence of economic feasibility to consumer trust. From the calculation that has been done, it is found significant level 0,181 and smaller than 0,05 and t count (- 1,344) < t table (1,6536) meaning that hypothesis that economic feasibility influence to consumer confidence rejected. The higher economic feasibility perceived by consumers does not guarantee the level of consumer confidence in the online shop. Now most of the consumers are seeing more products sold by brand rather than price. In accordance with Kotler's (2005) statement, the brand is a seller's promise to consistently deliver a particular look, benefit and service to the buyer. The best brands provide quality, but the brand is more than just a symbol. If the consumer has trusted a particular brand, then consumers will be more confident in the online shop, and goods received by consumers will not disappoint. These results are also reinforced by research Kim & Park (2013) which states that economic feasibility does not affect consumer confidence.

### *3.6. The Effect of Word of Mouth Reference to Consumer Confidence*

The result of hypothesis testing has proved there is influence of word of mouth reference to consumer trust. Through the calculation that has been done is obtained significant level of 0.004 and smaller than 0.05 and t arithmetic (2.993) > t table (1.6536) which means that the hypothesis that the word of mouth affect consumer confidence accepted. Reference Word of Mouth in the context of s-commerce in Instagram refers to product comments on postings online shop and consumers who get direct referrals from friends, colleagues or from families who have shopped through an online shop in Instagram that provides information that he thinks the recommended online shop it has advantages, can meet the needs and provide satisfaction. Like the price factor, to the friendly service and have a fast response. References coming from other parties who already have direct experience with the online shop, then there is a tendency of consumers to be able to trust the online shop. These results are reinforced by Chu & Choi (2011) which states WOM is known as an important marketing technique in online branding. Because it comes from the consumer's personal experience, WOM is more influential than other forms of communication, such as advertising because WOM offers reliable and reliable information (Gruen et al, 2006; Chatterjee, 2001). In addition, the results of this study is also reinforced by the research of Kim & Park (2013) which states the influence of reference to the word of mouth trust. There is also research Ashari (2017) which states the existence of a significant influence between the reference word of mouth to consumer confidence.

### *3.7. The Effect of Brand Image on Consumer Confidence*

The result of hypothesis testing has proved there is influence of brand image to consumer trust. From the calculation that has been done is obtained significant level of 0.000 and smaller than 0.05 and t arithmetic (5.839) > t table (1.6536) which means that the hypothesis that the brand image affects consumer trust is accepted. This statistical test proves that the brand image of the online shop in Instagram has an influence on consumer confidence. The existence of the influence of brand image on consumer confidence is based on Kotler's (2002) theory which states brand image is a number of beliefs held by consumers related to the brand. Kotler's statement shows that brand image is one factor buyers believe in the online shop even more so if the brand is already known by the public. Kotler (2005) also states that the brand is a seller's promise to consistently deliver a particular look, benefit and service to the buyer. The best brands provide quality, but the brand is more than just a symbol. If the consumer has trusted a particular brand, then consumers will be more confident in the online shop, and goods received by consumers will not disappoint. The results of this study reinforced by previous research from Juhaeri (2016) states that the brand image has a significant effect on trust.

## 4. Conclusions and Recommendations

### 4.1. Conclusion

From result of discussion tentang influence of social commerce characteristic to trust of cosumen, hence taken by conclusion that from result of hypothesis test have proven reputation, communication, references word of mouth, and brand image have positive and partially significant effect to consumer trust. While the quality of information, transaction security, and economic feasibility do not have a positive and not significant partially to consumer confidence. But reputation, quality of information, transaction security, communication, economic feasibility, references word of mouth and brand image have a positive and significant impact on consumer confidence.

### 4.2. Suggestion

Based on the results of this study, the suggestions can be given is that online business people not only pay attention to photos of their products, but also must pay attention to other aspects such as the quality of information provided should be more effective and specific, and pay attention to economic feasibility or economic value that can gain consumer confidence. Consumers who already have a sense of trust in the online shop will cause a sense of want to buy and will even make consumers mereferensikan online shop to others.

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# The Effect of People Business Credit on SME'S Development in Central Sulawesi, Indonesia

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**Abstract.** The objectives of this research are: (1) to describe SME's businessman characteristics in Central Sulawesi, (2) to analyze the effectiveness of management of People's Business Credit program (capital, manpower absorption, total credit, length of business) to increase added value (profit) for SME's that have obtained credit through the People's Business Credit (KUR) program. Dummy variable of this study including education, business type, and business location. Population of this research covers all community in targeted location who have received business credit from financial institution in Poso Regency, Donggala Regency, Parigi Moutong Regency, and Palu City. The number of sample in this research 270 SMEs that have been counted using Slovin method. Analysis methods used in this study consisting of descriptive analysis and multiple linear regression. The results show that characteristics of SME's businessman were found to be homogeneous in terms of age, gender, level of education, number of family dependents, type of business, business experience, business location, sales income, capital fund, capital source, amount of credit, and marketing problems. The results also suggest that the effect of capital before receiving credit, employees, amount of credit, length of business, education, type of business, and business location simultaneously perform significant effect on business income. The capital before receiving credit, amount of credit, length of business perform positive and significant effect on business income of SME's which received credit. Meanwhile, education, type of business and business location did not perform significant effect on business income of SME's that have received credit.

## 1. Introduction

The micro, small and medium enterprises (SMEs) sector is one of the pillars of the national economy that plays a role in sustaining the welfare of the Indonesian people. Absorbing a large number of workers and being dominant in the number of business units makes SMEs intensive in using local natural resources. Generally located in rural areas will have a positive impact on increasing the number of workers, reducing the amount of poverty, equity in income distribution and rural economic development [1]. Therefore, it is clear that SMEs need attention because they not only provide income for some the large workforce, however, is also the spearhead of poverty alleviation efforts in Indonesia.

Encouraging the development of SMEs to strengthen the structure of the national economy is not easy. The development of SMEs must be more directed towards improving their ability to become medium-sized entrepreneurs. However, it must face several obstacles such as ability level, skills, expertise, human resource management, entrepreneurship, marketing and finance. The weakness of managerial and human resource capabilities has resulted in small entrepreneurs not being able to run their businesses properly [1].

Several studies on Micro, Small and Medium Enterprises (MSMEs) also show that MSMEs play a role as a buffer for the national economy. Micro, Small and Medium Enterprises (MSMEs) play a positive role in opening employment and overcoming poverty, especially when many large businesses fall [2]. Furthermore [3], suggested that loan capital greatly affects the income of MSMEs. The greater the loan capital received, the greater the income generated.

The problem of poverty, unemployment, and even distribution of development is still a central issue in the regional economy. Although various intervention instruments have been pursued by the

government in order to overcome these macroeconomic problems, the macroeconomic problems are still an unfinished work.

The presence of SMEs in Indonesia plays a major role in providing employment, reducing poverty, reducing inequality of income distribution and improving national economy. On the other hand, one of the problems that hamper the development of MSMEs is a lack of capital insurance. The government created several programs to alleviate poverty by opening employment opportunities, one of which is the People's Business Credit (KUR) program.

People's Business Credit (KUR) is one of the government's flagship programs that are included in the micro and small-scale business empowerment-based poverty reduction intervention program group. This program aims to increase access to capital and other resources for micro and small businesses, where credit / working capital financing schemes and or KUR investments are specifically intended for Micro, Small and Medium Enterprises and Cooperatives (UMKMK) in productive and feasible businesses. but has limitations in fulfilling the requirements set by Banking (not yet bankable).

A Resource-Based View (RBV) can explain the effect of resources on improving business performance [4]. This theory considers microfinance credit as a financial source (tangible resources) to have an influence on the financial performance of SMEs. The RBV theory allows tangible resources and intangible resources to have an impact on the output produced by the company. Research has shown that successful internal resource management can significantly improve venture performance and the likelihood of survival [5]. This is in line with the neoclassical growth theory, namely the Solow growth model which shows that with the growth in capital stock, labor growth and technological advances that integrate in the economy will influence the output of goods and services as a whole [6]. One solution to overcome the problem of providing capital at the SME level is that funding from KUR can be proven to improve financial performance in SMEs ([7];[8];[9];[10];[11]; [12];[13];[14];[15]).While giving KUR or to SMEs does not have an impact on the financial performance and growth of SMEs ([16]; [17]).

Furthermore, the factors that influence credit demand for small businesses are age, gender, income, location, business sector, number of workers, number of dependents, length of business, and interest rate [18]. While the factors that influence small business decisions to take credit from formal sources are gender, family size, asset value, education, period of obtaining credit, contribution from the credit market, age, membership composition, period of receiving credit, and business situation [19].

Based on the above studies and theories, argument stating that the allocation of people's business loans can encourage the development of the economic scale of community MSMEs and also increase output, where the current conditions for the development of MSMEs, especially in Central Sulawesi, also continues to experience growth, which is an average increase of 1.08% per year. The positive trend of the growth of the number of Micro, Small and Medium Enterprises (SMEs) actors in Central Sulawesi Province has now reached 702.719 units and is expected to continue to grow and make a significant contribution in driving the populist economy (Information of the Central Sulawesi Provincial Government (2017) - the contents of the speech of the Deputy Governor of Central Sulawesi. Considering the importance of KUR in supporting the financing of MSMEs, it is necessary to study more deeply about the effect of transmission on improving capital aspects on the development of MSME business.

## **2. Research Method**

### **Population and Sample**

Population in this study were people in the study area who obtained the People's Business Credit from Financial Institutions (banks), in Palu, Donggala, Poso and Parigi Moutong Regencies as many as 9,191 Enterprises [20]. Techniques for determining respondents (Respondents who own a business using funding from the People's Business Credit). Sample size method to determine the number of samples employs Slovin formula [21] which is 270 samples of SMEs.

### **Types and Data Sources**

Data obtained in this study derived from primary data and secondary data. Primary data obtained directly from recipients of people's business loans (respondents) through questionnaires and interviews. While secondary data was obtained from the Bank Indonesia Central Sulawesi representative office and the District BPS Office and the Provincial BPS in the Central Sulawesi Region, Indonesia.

### **Data analysis method**

To find out the characteristics of MSME business actors a descriptive analysis was used. Characteristics of respondents include: age, gender, level of education, number of family dependents, type of business, business experience, location of business, sales results, capital assistance, source of capital, number of KUR received, and problems in marketing. And to find out the effect of additional KUR capital on the added value (profit), business income, working capital and absorption of new workforce is used multiple linear regression analysis [22].

### **Research Thinking Framework**

#### **Influence of Capital before Accepting Credit for Business Benefits**

Assets are company assets that describe a portion of past economic output that is not consumed. The change in company assets is a measure of company growth, because a high level of asset growth will make it easier for the company to expand its business to a greater extent. The amount of assets owned by the businessman shows his ability to develop his business and at the same time describe the working capital requirements needed [23].

Internal funds theory of investment says that the desired stock of capital depends on the level of profit. Explanation of the above theory, if linked to the use of funds, especially funding from people's business loans, research on the analysis of differences in financial performance between SMEs before and after using people's business loans funds, can prove that MSME Financial Performance has increased after using KUR funds (current Asset Ratio and Debt Equity Ratio). Financial Performance of SMEs has not increased after using people's business loans (Asset Turnover and Net Profit Margin) funds, [24].

Accurate profits reflect the expected profit. Because capital demand depends on the expected profit, the demand for capital is positively related to realized profit [25]. Every company is always trying to maximize its profits, so if there is an increase in profits, employers will continue to increase their product offerings. To meet the increase in the number of goods offered, the company will need greater working capital.

#### **Influence of Labor After Receiving Credit for Business Benefits**

The main objective of every government policy is aimed at eliminating the fundamental problems that are still fundamental, namely the problem of poverty, inequality of income distribution and other economic problems. Based on the results of the study, the distribution of KUR funds has a significant positive effect on the development of small-scale enterprises, as seen from the increase in the number of MSMEs, MSME workforce and MSME output value and the increase in Gross Regional Domestic Product (GRDP). However, it has a significant negative effect on poverty [26]. Another research with the theme of the Effect of the Development of SMEs on economic growth in the SME sector in Indonesia, the result is SME Exports, The Number of SME Units and Investment SMEs have a significant influence on Economic Growth in 2000 to 2009, while the number of SME Workers is not significant to growth economy [27].

The people's business credit program can increase the chances of employment, the results of the above research, give different results.

#### **Effect of Total Credit on Business Profits**

The amount of credit offered by institutional finance can determine the performance of SMEs in Indonesia terms of sale, liquidity and even operating costs. This is supported by several researchers such as [7]; [8]; [28]. For example, [28] argue that loan size has a positive effect on SME growth. It is also argued that businesses that receive adequate amounts of loans often perform better than those who do not [8] also argue that loans that are suitable for clients, according to the needs of SMEs affect business sustainability.

#### **Effect of Business Length on Business Benefits**

The longer the business runs, it will result in a significant business development in a positive direction. The development of the business depends on the trade climate and competition that occurs in the business or market world. Usually, a longer-standing business tends to be more developed because

it already has a lot of experience in running its business and is arguably well-established because it is more able to compete in the business world. Older companies also have more opportunities to collect retained earnings and reduce loan requirements if they are sufficient and internal [29]. Instead, new companies are trying to increase their financial amount to be able to grow their businesses. Banks may be willing to give credit to new companies but will be charged proportionally more (interest) than older companies because they are considered to have lower profit margins and are at high risk [30].

### **Educational Influence, Type of Business and Business Location of Business Profit (variable Dummy)**

The level of education is a long-term process that uses systematic and organized procedures, in which the managerial workforce learns conceptual and theoretical knowledge for general purposes. Thus, a person's level of education can improve the competitiveness of a company and improve the company's performance [31]. Business owners who have higher education tend to be able to reduce asymmetric information and appear more creditworthy. Therefore, business owners who have higher education have the knowledge to access credit from banks. Other research on the theme of the influence of assets, profits, length of business, perception of interest rates, gender, education and age on the decisions of MSMEs take bank credit. The results showed that the variables of the amount of assets, profits, sex, and education had a significant positive effect on the probability of MSMEs taking credit from banks, whereas for the interest rate perception variable had a significant negative effect, and for business duration and age variables had no significant effect [32].

## **3. Results And Discussion**

### **Descriptive Characteristics of Respondents**

Characteristics of respondents are characteristics possessed by respondents in connection with the business they manage. Descriptive characteristics of KUR recipient respondents are explained as follows:

#### **• Age of Respondents**

The age of respondents in Central Sulawesi Province is mostly in the classification of productive labor or in the active participation rate of 264 people (97.78%), while non-productive respondents aged > 64 years are only 6 people (2.22%). This indicates that respondents who receive KUR in Central Sulawesi Province will easily accept new innovations and information, especially in an effort to increase their business income.

#### **• Gender**

Gender gives a certain classification in the type of work, the results show that the recipients of KUR in Central Sulawesi Province are carried out by men and women. This states that women have a very important role in helping husbands to increase family income.

#### **• Level of education**

The education level of KUR recipient respondents in Central Sulawesi Province is mostly at the level of Secondary education, namely junior and senior high school. This means that in general the level of education held by KUR recipient in Central Sulawesi is quite good, so this gives an indication that the respondent is sufficient to have the ability to receive the new technology (innovation) applied, especially in an effort to increase production and business income. This is in line with the opinion [33] that the level of education is positively correlated with the ability of technology adoption (innovation). This condition illustrates that the quality of human resources is quite high. This situation is expected to have a positive value on the ability to manage its business, thereby giving effect to individual economic growth or society in general [34].

#### **• Number of family dependents**

The results showed that the majority of respondents, 239 people (88.52%) had a family burden of 0-4 people, while only 1 person (0.37%) had a family burden of 10-14 people. This shows that in addition

to being a potential source of labor, the number of family dependents that have relatively little impact on the burden of the family, but in managing its business will require more workers from outside.

• **Business Experience**

The results show that, the type of business conducted by KUR recipient respondents is mostly trading business types of 60 people (55.56%). The type of agricultural business is 22 people (20.37%), businesses engaged in services are 14 people (12.96%) and other types of businesses are 12 people (11.11%). However, no one does business in the industry. This illustrates that the overall business experience of respondents in trying is relatively good enough, so that it is expected to be a reference in managing the next business.

• **Starting Year of Business**

The results show that the majority of respondents started their business between 2002 - 2017 as many as 211 people (78.15%), while 9 people (3.33%) started their businesses first (1970 - 1985). This shows that along with the increasing needs of life and various types of business opportunities available, the respondents are interested in starting a business with the aim of being able to meet the needs of daily living.

• **People's Business Credit Fund (KUR)**

The results show that, most of the KUR funds received by respondents amounted to between IDR 20,000,000 - IDR 100,000,000 as many as 177 people (65.56%). This indicates that respondents in Central Sulawesi Province have a relatively good business, so that the KUR fund channeling bank entrusts the respondents to borrow a number of KUR funds with a high amount of borrowing. With this program it is expected that MSMEs in Indonesia can compete in the midst of the incessant implementation of the Asean Economic Community (MEA).

• **Business Location**

The results show that the business location of KUR recipient respondents in Central Sulawesi Province is mostly near the product factor market with a total of 153 people (56.67%). This indicates that the business location of KUR recipient respondents is close to the product factor market, making it easier for respondents to sell their products to consumers.

• **Total Revenue or Total Revenue (TR)**

The results showed that most of 146 people (54.07%) TR respondents (TR) were above IDR 100,000,000 for 1 year, but only 21 people (7.78%) less than Rp. 10,000,000 in 1 year. This data illustrates that the respondent's business is relatively quite successful with the acquisition of revenue in a year that is quite high. High acceptance is expected to have an impact on increasing income, welfare, increasing business and creating employment.

• **Marketing**

The results show that the level of business competition that occurs in KUR recipient respondents in Central Sulawesi Province is in the medium category with a percentage of 47.41% (128 people). This situation indicates that respondents generally engaged in micro, small and medium enterprises face the problem of lack of expertise in the fields of marketing, organization and management, as well as the limited capital that can be obtained

**Simultaneous Testing of the influence of Capital before receiving credit, labor after receiving credit, amount of credit, length of business, education, type of business, and location of the business against the business profits of the recipient of credit.**

Simultaneous analysis is used to study the effect of capital before receiving credit, labor after receiving credit, amount of credit, length of business, education, type of business, and location of business to the business beneficiaries of credit. The results of multiple regression analysis are carried out. ANOVA from the factors that influence the Business Benefit of Credit Recipients as follows:

**Table 1.** Anova Factors Affecting Business Benefits of Credit Recipients



Source of Diversity	Db	Number of squares	Middle Squares	F-count	Pr > F
Regresi	7	41.180.000.000.000.000	5.883.000.000.000.000	348,177	0,000
Residual	262	4.427.000.000.000.000	16.900.000.000.000		
Total	269	45.610.000.000.000.000			

Source: Processed SPSS version 18

Table 1 shows the probability of  $0.000 < 0.010$  ( $\alpha = 1\%$ ) indicates that null hypothesis is rejected, meaning that the independent variable of capital before receiving credit, labor after receiving credit, amount of credit, length of business, education, type of business, and business location simultaneously affect profit recipient business credit.

The results of this study indicate that the initial capital or capital before receiving credit, labor after receiving credit, amount of editing, length of business, education, type of business and location of business; which is an integration of organizational resources (SMEs) can increase business profits. In line with the view of the Resource Based (RBV) can explain the influence of resources on business performance ([4],[35]). This research is in line with [36] and [37] which prove that tangible resources can affect business performance. Other research that proves successful internal resource management can significantly improve venture performance and the possibility of survival [38].

**Partial testing of the influence of capital before receiving credit, labor after receiving credit, amount of credit, length of business, education, type of business, and location of the business against the business profits of the recipient of credit.**

The influence of each independent variable on the dependent variable using the t test is presented in Table 2.

**Table 2.** Results of Estimating the Parameters of Equity of Business Benefit of Credit Recipients

Variabel	Koefisien	Standard Error	t- hitung	Pr > t	Koefisien Elastisitas
Intercept	10.130.000,00	1.565.950,61			
X1 = <b>Capital before receiving credit (Rp)</b>	0,439	275.067,09	20,818	0,000	0,732
X2 = <b>Labor after receiving credit (People)</b>	0,083	262.123,88	4,143	0,000	0,000000013
X3 = <b>Amount of credit (Rp)</b>	0,697	267.865,90	33,945	0,000	2,371
X4 = <b>Length of business (Year)</b>	0,068	29.970,00	3,474	0,001	0,000000067
D1 : <b>Dummy education</b>	-0,009	1.499.734,21	-0,465	0,642	
D2 : <b>Dummy type of business</b>	-0,025	815.914,42	-1,195	0,233	
D3 : <b>Dummy location of the business</b>	-0,009	556.498,71	-0,414	0,679	
Koefisien determinan (R <sup>2</sup> ) = 0,900					

Source: Processed SPSS version 18

The determinant coefficient (R<sup>2</sup>) adjusted by 0.900 indicates that variations in the recipient's business profits can be explained by the independent variable of capital before receiving credit, labor after receiving credit, amount of credit, length of business, education, type of business, and business location simultaneously (together - equal to 90%, while the remaining 10% is explained by other factors not included in the model In Table 2, inform the results of the study as follows:

**Capital before receiving credit** has a significant and positive effect on the business profits of the recipient of the credit, where the probability of  $0.000 < 0.01$  ( $\alpha 1\%$ ) is a two-way test. The elasticity

coefficient of 0.732 is inelastic ( $0.732 < 1$ ) meaning that any increase in initial capital of 1% can increase the recipient's business profit by 0.732%, assuming other factors are considered constant. This shows that the initial capital in the business becomes one of the factors that must be considered by business actors in making decisions to increase the business profits of the recipient of credit.

The initial capital, which is an asset, can increase the signal about the company's performance, while assets which decline, indicate a signal of a decline in company performance [38]. The amount of assets owned by the entrepreneur shows his ability to develop his business and at the same time describe the working capital requirements needed. Every company is always trying to maximize its profits, so if there is an increase in profits, employers will continue to increase their product offerings. To meet the increase in the number of goods offerings the company will need greater working capital [25]. The need for additional capital can be realized by increasing the capital offered by the KUR program. The results of the study related to this are from [24] with the title of analysis of differences in financial performance between MSMEs before and after using KUR funds. Financial Performance MSMEs have increased after using KUR funds (current Asset Ratio and Debt Equity Ratio). Financial Performance of MSMEs has not increased after using KUR (Asset Turnover and Net Profit Margin) funds.

**Labor after receiving credit** has a significant and positive effect on the business profit of the recipient of credit, where the probability of  $0.000 < 0.01$  ( $\alpha 1\%$ ) is a two-way test. The elasticity coefficient of 0.000000013 is inelastic ( $0.000000013 < 1$ ) can be interpreted that any increase in labor after receiving credit of 1% can increase the recipient's business profit by 0.000000013%, assuming other factors are considered constant. This shows that the workforce after receiving credit at the business becomes one of the factors that must be considered by the business actor in making a decision to increase the business profits of the recipient of the credit.

**The amount of credit** has a significant and positive effect on the business profit of the recipient of the credit, where the probability of  $0.000 < 0.01$  ( $\alpha 1\%$ ) is a two-way test. 2,371 elasticity coefficients are elastic ( $2,371 > 1$ ) can mean that each increase in the amount of credit by 1% can increase the recipient's business profit by 2,371%, assuming other factors are considered constant. This shows that the amount of credit in a business is one of the factors that must be considered by businesses in making a decision to increase the business profits of the recipient of credit. The results of this study are in line with the research of [3], concerning the Analysis of the Influence of Own Capital and Capital of People's Business Credit Loans (KUR) on the Income of MSME Entrepreneurs in Toba Samosir Regency (Case Study: PT Bank SUMUT Branch Balige)". The results showed that 85.7% of the producers increased after borrowing the People's Business Credit (KUR) from PT Bank SUMUT, Balige Branch, while 14.3% did not experience an increase due to unproductive credit usage. And the magnitude of the effect of the independent variable X1 (own capital) and the independent variable X2 (credit capital) on the change in income level of MSME entrepreneurs, this effect has a positive value of 0.045 and 0.119 or it can be said the higher the own capital and loan capital of People's Business Credit (KUR) the higher the level of income that will be received by MSME entrepreneurs in Toba Samosir Regency. Other studies that support that loan size has a positive effect on SME growth ([28] and [8]).

Another study that is in line with these results was done by [39], about "The Effect of Giving People's Business Credit on the Income of the Ladang Panjang Community in Tigo District, Pasaman Regency (Case Study: SME Ownership Society)". The results showed that the magnitude of the effect of the independent variable X1 (KUR) on the income of the Society that owns Small and Medium Enterprises (UKM) is 0.869. This influence is positive or it can be said that the more capital that the community uses in its business, the more it increases their income. Where each increase in KUR they receive (X1) the income of people who own Small and Medium Enterprises (SMEs) will also increase.

Business duration has a significant and positive effect on the business profit of the recipient of credit, where the probability of  $0.001 < 0.01$  ( $\alpha 1\%$ ) is a two-way test. The elasticity coefficient of 0.000000067 is inelastic ( $0.000000067 < 1$ ) can be interpreted that each increase in business duration by 1% can increase the business profit of the recipient of the credit by 0.000000067%, assuming other factors are considered constant. This shows that the length of business effort becomes one of the factors that must be considered by businesses in making decisions to increase the business profits of recipient credit.

The longer the business runs, it will result in a significant business development in a positive direction. The development of the business depends on the trade climate and competition that occurs in the business or market world. Usually, a longer-standing business tends to be more developed because it already has a lot of experience in running its business and is arguably well-established because it is

more able to compete in the business world. Instead, new companies are trying to increase their financial amount to be able to grow their businesses. Banks may be willing to give credit to new companies but will be charged proportionally more (interest) than older companies because they are considered to have lower profit margins and are at high risk [30].

Table 2 shows **education, type of business, and business location** which have no significant and negative effect on the business profit of the recipient of credit, where the probability of  $0.642 > 0.05$  ( $\alpha$  5%) is a two-way test.

The RBV theory explains that internal resources are strategic resources that can improve company performance [35]. These strategic resources address tangible and intangible resources. If Education is an intangible resource (human capital) in this study can not improve financial performance, it can be said that SMEs that use People's Business Credit funds directly can not improve financial performance. More relies on business experience and intuition ([40] and [41]).

The type of business and location which is a dummy variable has no effect on determining the profitability of SMEs, so it is not in line with the research conducted by [18] examining the factors that influence credit demand in small businesses in Meru Central District, Kenya the dependent variable is a dummy variable related to the location and business sector (type of business) has a positive relationship to the decision to take credit. Specifically based on descriptive research results, the type of business in this study is more dominantly influenced by the type of dominant trading business providing higher profits than other types of business. While the business location in the village or in the city, close to the market or in the middle of a resident's house, is more dominant the SME recipient of the People's Business Credit that is around the market and in the location in the village.

#### 4. Conclusion

Based on the results of the study it can be concluded as follows.

1. People's Business Credit recipient respondents in this study have relatively homogeneous characteristics, both in terms of age, gender, level of education, number of family dependents, type of business, business experience, location of business, sales results, capital assistance, sources of capital, the amount of People's Business Credit received, and the problem in marketing
2. The results of the study prove that the influence of capital before receiving credit, labor after receiving credit, amount of credit, length of business, education, type of business, and business location simultaneously affect the business profits of the recipient of credit. The results of the determinant coefficient ( $R^2$ ) of 0.900 indicate that variations in the recipient's business profits can be explained by the independent variable of capital before receiving credit, labor after receiving credit, amount of credit, length of business, education, type of business, and their location simultaneously by 90%.
3. Capital before receiving credit has a significant and positive effect on the business profits of the recipient of credit. Workforce after receiving credit has a significant and positive effect on the business profits of the recipient of credit. The amount of credit has a significant and positive effect on the business profits of the recipient of credit. Business duration has a significant and positive effect on the business profits of the recipient of credit. Meanwhile, education, business type and business location perform insignificant and negative effect on business profits of recipients of credit.

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# Measurement and Implementation of Participation Principle in Indonesia's Local Government

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**Abstract.** The purpose of this study is to develop the scoring of Good Public Governance (GPG) in Indonesia in accordance with the GPG principles prepared by The National Committee on Governance Policy (KNKG) and adjusted to the indicators in the Indonesia Governance Index (IGI) as well as the Evaluation of Local Government Performance (EKPPD). Moreover, this study wants to present an overview of GPG implementation in Indonesia's local government (Districts/Cities) for three years since 2013 to 2015 based on the proposed scoring. In this case this study will present an overview of GPG implementation and also the scoring limited to participation principle. This research uses quantitative descriptive analysis method by create mapping of IGI indicators with EKPPD with GPG principles by KNKG and IGI. The analysis drawn based on 508 Local Government during 2013-2015. Overall, GPG implementation especially on participation principles on Local Government shows an increasing trend for three years. Participation/Democracy Principle is characterized by the increasing stakeholder participation that can be seen from the increased cooperation with other local governments.

## 1. Introduction

One of the backgrounds of bureaucracy reform including improving the quality of good governance system in Indonesia is the incident of crisis that hit the world that happened at the end of the new order era and experienced by most developed countries and even developing countries is no exception Indonesia. But because of the occurrence of this crisis, then can see the ability to survive from companies that applied Good Corporate Governance (GCG) better than those who did not apply it

However, good governance does not seem to work effectively yet. because the success of the implementation of good governance is only felt in the business sector. Then The National Committee on Governance Policy (KNKG) formulated Good Public Governance (GPG) general guidelines in 2008 so that the three pillars of good governance which are government, business sectoral, and society can achieve success and maximum results.

GPG implementation basically has the same direction with New Public Management (NPM) concept

which has been applied first. To perform an action that is intended to improve the efficiency and effectiveness of public services and public service organizations, and to have a view or values that promote accountability and improved delivery of public services is the definition of the implementation of new public management program stated by Heyer (2011). New Public Management continues to expand and subsequently New Public Governance (NPG) is emerge. But over time, the problems found

were growing. and it turns out that this problem can't be solved only by applying NPM. Then new public governance was applied which then now known as good public governance

Parties outside the government also has made the identification of the principles of good public governance, in addition carried out by KNKG they carried out also by the Partnership for Governance Reform (The Partnership for Governance Reform) in collaboration with the Australian Agency for International Development (AusAID) stated in research by Gismar et al. (2013). The Indonesia Governance Index (IGI) is the result of identification by the Partnership. IGI is the result of the rating

as outlined in the index of Indonesian governance which becomes an independent institution of non-governmental partnership is a comprehensive, measurable, and rich data tool that needs to be encouraged to be a reference for all stakeholders to evaluate the performance of local / municipal management whether it has been successful or not.

The government itself also conducts evaluations that can also be used to find out how well local governance is. Based on Law Number 32/2004, it is necessary to make guidance about evaluation to local government which one of them is Evaluation of Performance of Local Government Implementation (EKPPD).

Based on the discussion mentioned above, the purpose of this research is to know the result of comprehensive descriptive analysis of the application of Good Public Governance (GPG) principles especially the participation principle to local government in Indonesia year 2013-2015 based on the scoring result based on the principles of National Committee on Governance Policy KNKG) and the Indonesian Governance Index (IGI) measured based on IGI indicators and Evaluation of Local Government Performance (EKPPD).

## 2. Literature review

### 2.1 Agency Theory in the Public Sector

According to Jensen and Meckling (1976) the agency relationship in agency theory as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent. However, in this agency relationship if both parties are maximized utilities, they will aim to maximize the interests of each party, resulting in agency problem in the form of differences in decision making between decisions taken by the agent (management) with the decisions which in turn improves the welfare of the principal (owner).

And according to Lane (2003) states that public organizations can apply agency theory. Rahim & Martani (2015) explained that local government is an agent in implementing government with its main stakeholders is the community so that information about the implementation of local government should be available for the community. According to Halim and Abdullah (2006) the agency relationship that exists in the public sector is the relationship between the legislature (principal) and the executive (agent).

Examples of agency problems that occur in the field of governance is sometimes the implementation or governance is only directed to the interests of a group of government officials only, and deviate from the goal of governance itself, or sometimes the policies that have been made by the government as a regulator is sometimes not oriented to the interests of society so the policy is only profitable for the government alone.

From the existing agency problem arises monitoring cost against the government as an agent in the form of criminal punishment, dismissal, or other punishment. So, to minimize these costs, the government often disclose information in the form of reports on government performance that has been done during a period and published to the public as the principal so that the public can monitor activities or actions and activities undertaken by the government so far and the government can be to account for it.

### 2.2 Good Public Governance

In his explanation Kooiman (1987) states that governance is a series of socio-political interaction process between government and society in various fields related to public interest and government intervention on those interests.

According to KNKG (2008) to create a conducive situation in order to implement the GPG, there are three related and interrelated pillars which consist of state, corporate world, and society. GPG should be formulated and implemented by the state as a basic guideline in exercising its authority, duties and functions. While the business world must formulate and implement Good Corporate Governance (GCG) in conducting its business so as to increase national productivity. And the society should exercise effective social control over the performance of the duties, functions and authorities of the state.

### *2.2.1 Good Public Governance Principles Based on KNKG.*

KNKG divides the five principles of GPG which are democracy, transparency, accountability, culture of law, fairness and equality. The basic principle in democracy contains three main elements of participation, recognition of differences of opinion and the realization of the common good. This principle is applied in the election process (elect and chosen) as the organizer of the state as well as in the process of organizing the country. The basic principle of the transparency is the provision of adequate and accessible information by stakeholders and disclosure elements. The basic principle of accountability is that it contains the clarity of function as an element in the organization and how to account for it. Legal culture has a basic principle that contains elements of law enforcement firmly without discrimination and obedience to the law by society based on awareness. And the last the basic principle of fairness and equity is the existence of elements of justice and honesty contained so that in its implementation can realize the equal treatment of the stakeholders responsibly.

### *2.3 Indonesia Governance Index (IGI)*

IGI is a composite index that measures local good governance by referring to the ranking of objective criteria measured by 89 indicators and is a continuation of Partnership Governance Index (PGI) which has been done before and has been tested by Knowledge and Resource Center (KRC), which is a unit in the Partnership that also serves as a granary of knowledge, expertise, and experience in guarding governance reform in Indonesia.

The IGI assessment includes four arenas consisting of bureaucratic arenas, the government arena (political office), the arena of economic society, and the arena of civil society. When the four arenas can interact in a balance to create a synergy of development that gives results for the common good.

#### *2.3.1 Good Public Governance Principles Based on IGI.*

Of the various principles of governance, IGI chose 6 (six) which is considered the most appropriate to the socio-political conditions that exist in Indonesia. The six principles are participation, fairness, accountability, transparency, efficiency and effectiveness.

The principle of participation is to see the level of involvement of stakeholders in the policy-making process in every arena and sub-arena. while justice is a condition where policies and programs can be applied fairly to all parties (non-discriminatory) to status, race, religion, or gender. Then accountability is a condition in which when officials, institutions and public organizations in every arena are responsible for all their actions and responsive to the public. Then the transparency is a condition in which decisions have been made by public officials, non-governmental organizations and business institutions in every arena as well as a sub-arena open to the public to provide input, monitor and also evaluate and the conditions under which public information is available or accessible to the public. While efficiency is a condition in which the policies and programs undertaken have optimized the use of human, financial, and time resources. And the last is effectiveness is the condition where the objectives of the policy and the outcome of the program being run have achieved the expected objectives

### *2.4 Evaluation of Local Government Performance (EKPPD)*

Evaluation of Local Government Performance (EKPPD) is a process of collecting and analyzing data systematically on the performance of local governance by using performance measurement system. In an effort to improve performance based on good governance principles EKPPD conducted to assess the performance of local governance.

Implementation of EKPPD is done by National Team, Technical Team, Regional Team and Secretariat of National Team



### 3. Research method

#### 3.1 Research method

The method used in this research is descriptive analysis with quantitative approach. The purpose of descriptive research is to describe the mechanism of a process and create a set of categories or patterns. (Prasetyo, 2008).

After develop GPG scoring, we will then implement the scoring to assess the level of participation in local government in Indonesia. Based on those assessment, we will be able to present highest or lowest score for each local government.

#### 3.2 Type and Source of Data

The type of data used in this study is secondary data. The secondary data in this research is in the form of EKPPD assessment work paper that has been filled with the assessment result for each indicator of local government at the districts / cities level throughout Indonesia during the period of 2013 until 2015.

#### 3.3 Sample and Population

The population in this study is districts / cities government throughout Indonesia during the period of 2013-2015 as many as 1524 districts / cities government which each year as many as 508 districts / cities government. The trends in participation principle can be seen based on the result for these three periods.

#### 3.4 Data analysis technique

*3.4.1 Literature review.* This research begins with a review phase of the literature that researchers collect a variety of information sourced and based on basic theoretical and legislation related to GPG.

*3.4.2 Collecting information.* Then the next step done by the researchers is to collect various information needed related to GPG principles mapping and comprehensive descriptive analysis of the assessment results or scoring on each GPG principles at all local governments at the district level in Indonesia during 2013 to 2015. In this case the information were collecting is limited to information related participation principle.

*3.4.3 Mapping the GPG principles.* The GPG principles used in this study are principles based on GPG General Guidelines released by KNKG and also GPG principles used in IGI conducted by the Partnership for Governance Reform. The GPG principles between the two sources are then compared. But in this case the research will be focused on participation principle.

After develop GPG scoring, we will then implement the scoring to assess the level of participation in local government in Indonesia. Based on those assessment, we will be able to present highest or lowest score for each local government.

Mapping EKPPD Indicators with IGI Indicators. After mapping the GPG principles from two different sources, the next step is to mapping each indicator to the each GPG principles. GPG assessment indicators used in this study are based on the indicators contained in the IGI and EKPPD. The IGI indicator is used in this study because IGI has divided its indicators into each arena as well as each principle, while the indicators EKPPD used to as a measurement tool in this research. The indicators

*3.4.4* used in EKPPD work papers are basically not classified according to GPG principles, therefore it is necessary to map the IGI indicator with the EKPPD indicator so that the EKPPD indicator used as the measurement tool in this research can be classified and identified into the suitable GPG principles.

Of the total indicator IGI initially amounted to 89 (eighty-nine) indicators, after mapping only 42 (forty-two) selected indicators, but specifically on the principle of participation there are only 7 IGI indicators that relate to 12 indicators of EKPPD. More details can be seen in table 1.

**Table 1.** Mapping of principles and indicators of participation.

Principle	IGI code	Indicators of IGI	The indicator (which relates) is a measuring instrument	Rationalization	Source of data
<b>Participation</b>	GIP1	Accommodation of district program proposal in district / city community consultations on development planning held annually from the village level (in January) to the national level (in May) (musrenbang) result	Number of programs of Local government development plan/s (RKPD) accommodated in Local government department/agency work plan/s (RENJA SKPD)	In the EKPPD indicator discusses how many local government programs contained in the RKPD are accommodated in the RENJA SKPD or those contained in the RENJA that are accommodated in RKA and DPA SKPD. While the indicators contained in IGI focus more on the programs that are still proposed in Musrenbang to be accommodated. So, it can be concluded that both of them are related because they have the same general objective of local government program accommodation.	EKPPD
			Number of programs of RENJA SKPD accommodated in Local government department/agency budget and work plan/s (RKA SKPD)		EKPPD
<b>Participation</b>	G2P1	Quality of public hearings of Draft local government budget (RAPBD) discussions or other financing	Number of programs of RENJA SKPD that are accommodated in Budget implementation document of local government departments / agencies (DPA SKPD)	Public hearings are usually conducted when regulations or policies are being formulated, including local regulations or budget plans. Therefore, the EKPPD indicator is considered to be related to the IGI indicator because the number of local regulations is considered to represent public hearings conducted during the formation until the formation of these local regulations.	EKPPD
			Number of local regulation (Perda) of the current year		EKPPD

	G4P1	Quality of stakeholder hearings / interactions with the Governor	Frequency of cooperation with other regions	Cooperation can be considered as one form of interaction while other areas are stakeholders, so the EKPPD indicator is considered to be related because it is considered as a form of stakeholder interaction to a region and most likely related to the governor as regional leader either directly or indirectly. The higher the frequency of cooperation with other regions, then it is considered better the quality of the interaction.	EKPPD
	G3P1	Quality of public complaints channels in strengthening Regional representative assembly or local legislative assembly (DPRD) oversight function	Facilitation of community participation	Facilities provided to the public such as the web, bulletin boards, complaint posts, leaflets, and mobile cars can be a means for the community, including in the case of complaints that can assist DPRD function especially supervision. The unit of measure in this EKPPD indicator is a scoring that can represent how well the quality of the facility includes the grievance channel.	EKPPD
<b>Participation</b>	C1P1	Communities provided by civil society organizations (CSO)s for advocacy and monitoring.	Performance Achievement Aspect Minimum Service Standards: Early Childhood Education (PAUD)	PAUD describes how big early age children who have received education at his age, it shows that early childhood can be a container of community involvement is characterized by the number of students who have received education at an early age	EKPPD
			Performance Achievement Aspect Minimum Integrated Health Pos (Posyandu)	Posyandu is considered to be related because posyandu can be considered as a forum for community involvement. This posyandu indicator indicates how active posyandu is available in the community environment which indicates the more active a posyandu, the higher the community involvement in it	EKPPD
	C2P1	Community involvement by civil society organizations	Performance Achievement Aspect Minimum Service Standards:	CSOs can be organizations, foundations, or institutionalized societies. PKK is an institutionalized association at	EKPPD

	(CSO)s in community empowerment efforts	Family Welfare Movement (PKK) is active	the regional level. In practice the maintenance of the PKK is often filled by society who are also members. The PKK also has a basis for community empowerment, especially women or mothers in the local area. Therefore, these two indicators are considered to be related because the PKK actively describes CSO community involvement in community empowerment efforts	
		Availability of Planning document: Long term development plan both at local government level (RPJPD)	In long-term, medium-term, and short-term regional development planning will result in planning documents as well as policies including RPJPD, RPJMD, RKPD. In this planning, stakeholders are usually involved in the process in order to convey their aspirations and understandings including business associates who are also stakeholders. So that the existence of these documents is considered to represent a form of business association involvement also in the formulation.	EKPPD
E1P2	The involvement of business associations in the formulation of regional development policies	Availability of Planning document: Local go government medium term (5 year) development plan/s (RPJMD)		EKPPD
		Availability of Planning document: Local government work/development plan/s (RKPD)		EKPPD

3.4.5 *Trend indicators on the GPG participation principle.*

Indicator trends on the principle of participation in general at all district / city level governments across Indonesia are also of concern in this study. From the results of these trends can be known which indicator indicators that have experienced an increase or even decreased during the period of this study.

3.4.6 *Factor Analysis.*

Factor analysis according to Williams, Onsman, Brown et al. (2010) is an important instrument used in the development, refinement, and evaluation of tests, scales, and measurements. In this study using factor analysis to reduce the variables in large numbers that are mutually independent into a group or smaller components called by factors with regard to and based on the relationship between these variables. In factor analysis, factor extraction is necessary. There are several ways to extraction factor, but in this research the extraction factor used is through Principal Component Analysis (PCA). Netemeyer, Bearden et al. (2010) suggests PCA is considered more useful if researchers originally developed an instrument with multiple items and were interested in reducing the number of items.

3.4.7 *Scoring and Rating.*

After each indicator has been filled with value data, then performed data processing using Principal Component Analysis technique through Statistical Package for the Social Sciences (SPSS) 23.

After each local government the district / city level has obtained the scoring result on the principle of participation then done the ranking based on the scoring result in each principle to know 5 (five) local government at district / city level with the result of scoring on the quality of applying the principle of participation. It also serves to know which local governments still need improvement and improvement in the application of GPG principles, especially the principles of participation and what indicators are key in terms of improving GPG quality to the local government.

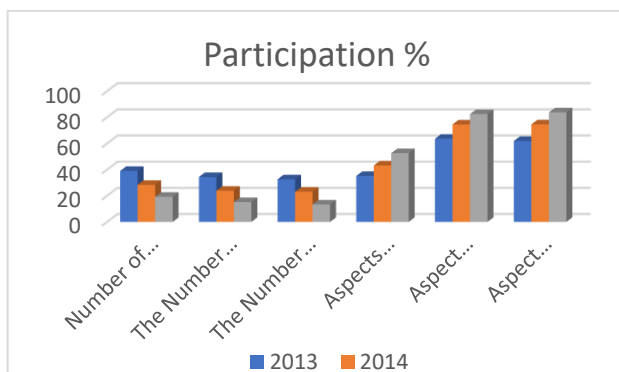
## 4 Discussion

### 4.3 Results of Data Processing on Principles of Participation

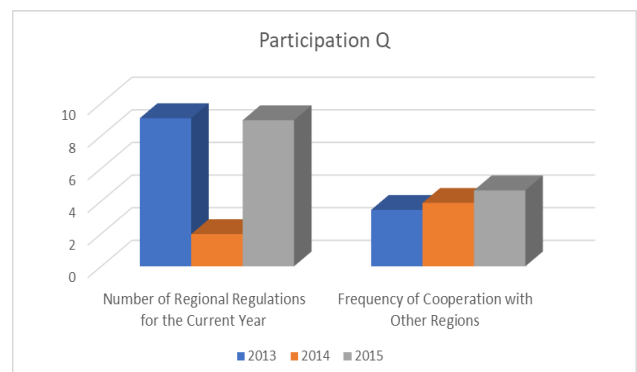
The following is the result of data processing on the principle of participation starting from the trend of the indicators on the principle of participation, doing factor analysis, up to scoring and ranking on the principle.

#### 4.3.1 Trends Indicators Principles of Participation.

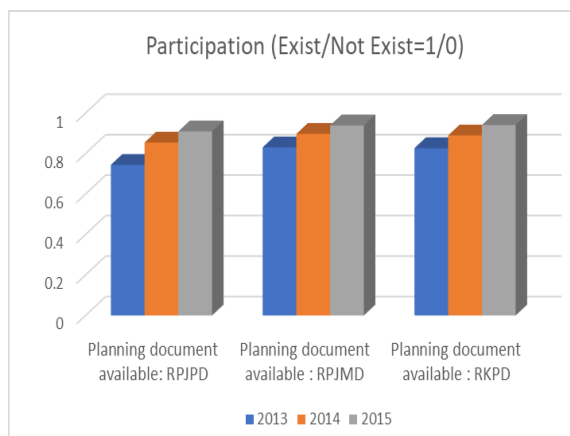
From 12 (twelve) indicators present in the principle of participation, then will be divided into four categories of measurement units, namely percentage, quantity, scoring (0-5), and "exist" / "not exist" (1/0). the average indicator trend has increased.



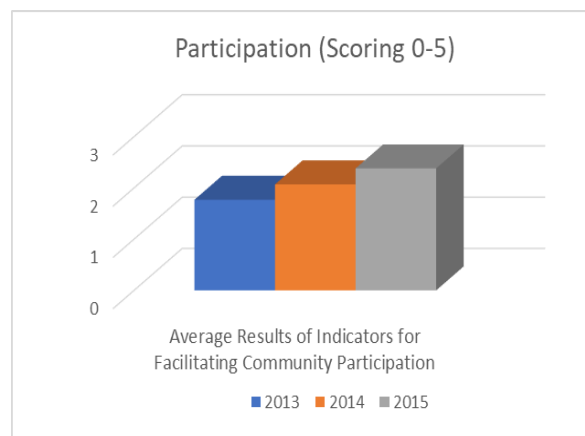
**Figure 1.** Trends Indicators Principles of Participation (percentage)



**Figure 2.** Trends Indicators Principles of Participation (quantity)



**Figure 3.** Trends Indicators Principles of Participation (exist/not exist = 1/0)



**Figure 4.** Trends Indicators Principles of Participation. (scoring 0-5)

#### 4.1.2 Factor Analysis Principles of Participation.

From 12 (twelve) variables that exist on the principle of participation, 11 (eleven) of them entered into data processing using factor analysis because it has met anti image testing.

As many as 1046 samples can be used in the test because it has met the criteria of testing on descriptive statistics. In table 2 it can be seen that the KMO value of the principle of participation reached 0.757, which means it has exceeded the minimum required limit of 0.50 and Bartlett's Test p-value of this principle is also less than 0.05 meaning significant variables so that the data on the variable the principle of participation can be further analyzed.

**Table 2.** KMO & Barlett's Statistics Test Construct Principles of Participation.

<b>KMO and Bartlett's Test</b>			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy			.757
Bartlett's Test of Sphericity	Approx. Chi-Square		4011.030
	df		55
	Sig.		0.000

In addition to KMO, the other stages of Anti Image. as mentioned earlier, that the selected variables in this study are as many as 11 variables because it meets the criteria on Anti Image. The criteria required in this Anti Image testing is the value that must be achieved on each variable that is at least 0.50. Variables that do not meet the criteria in Anti Image measurement are 'Availability of RPJMD Planning Document' because this variable does not meet the minimum threshold value in Anti Image measurement. So, for the variable that does not meet the minimum threshold value must be issued because it can't be analyzed further.

The next step is to perform component extraction using Principal Component Analysis (PCA) method. Table 3 shows the results of component extraction using the PCA method and from these results are formed three components that are considered to represent the principle of participation.

**Table 3.** Statistics Total Variance Explained in Constructive Principles of Participation.

Component	<b>Total Variance Explained</b>						
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.191	29.007	29.007	3.191	29.007	29.007	3.072
2	1.386	12.596	41.603	1.386	12.596	41.603	1.817
3	1.081	9.830	51.433	1.081	9.830	<b>51.433</b>	1.465
4	.988	8.983	60.416				
5	.986	8.961	69.376				
6	.935	8.500	77.876				
7	.806	7.331	85.207				
8	.722	6.560	91.767				
9	.592	5.382	97.149				
10	.259	2.356	99.505				
11	.054	.495	100.000				

Before extracted there are 11 independent variables but after extraction then formed 3 components that have eigen value more than 1 and each component consists of correlated variables. These three components are considered to explain the variation of all data on the principle of participation of 51.433%. Then from the three components can be seen the variables included into each component based on the largest loading factor as can be seen in table 4.

**Table 4.** Results of PCA Method Reduction Principle of Participation

	Component		
	1	2	3
P_ Number of programs of RENJA SKPD accommodated in RKA SKPD	<b>.974</b>	.035	.007
P_ Number of programs of RENJA SKPD accommodated in DPA SKPD	<b>.964</b>	.036	.019
P_ Number of programs of RKPDP accommodated in RENJA SKPD	<b>.900</b>	.015	.001
P_ Availability of Planning document: RKPDP	<b>-.222</b>	-.128	-.056
P_ Facilitation of community participation	.082	<b>.733</b>	-.120
P_ Performance Achievement Aspects Minimum Service Standards: Early Childhood Education (PAUD)	.038	<b>.633</b>	.116
P_ Number of local regulation (Perda) of the current year	.110	<b>.543</b>	-.061
P_ Facilitation of community participation	-.373	<b>.458</b>	.118
P_ Performance Achievement Aspect Minimum Service Standards: Integrated Health Pos (Posyandu)	.170	.008	<b>.784</b>
P_ Performance Achievement Aspect Minimum Service Standards: Family Welfare Movement (PKK) is active	-.087	-.084	<b>.763</b>
P_ Availability of Planning document: RPJPD	-.019	.018	<b>.326</b>

The three components formed from the grouping results on the principle of participation are then named according to the substance of the constituent variables. The new name of the grouping results can be seen in table 5.

**Table 5.** Breakdown Component Principle Participation according to PCA

Variabel	New Component Name	Factor Loading (%)
Number of programs of RENJA SKPD accommodated in RKA SKPD	Accommodation Program	56%
Number of programs of RENJA SKPD accommodated in DPA SKPD		
Number of programs of RKPDP accommodated in RENJA SKPD		
Availability of Planning document: RKPDP		
Facilitation of community participation	Provision of Public Facilitation	24%
Performance Achievement Aspects Minimum Service Standards: Early Childhood Education (PAUD)		
Number of local regulation (Perda) of the current year		
Facilitation of community participation	SPM Achievement On	19%
Performance Achievement Aspect Minimum Service Standards: Integrated Health Pos (Posyandu)		

Performance Achievement Aspect Minimum Service Community  
 Standards: Family Welfare Movement (PKK) is active Participation  
 Availability of Planning document: RPJPD

#### 4.1.3 Results Scoring and Ranking Principles of Participation.

From the scoring on the principle of participation for three years that is 2013-2015 the highest value ever achieved by the Riau Islands provincial government, especially the city government of Batam amounted to 3.570757 in 2015 as can be seen in table 6. This is supported by the number of programs Long Term Plan Work Unit Local (RENJA SKPD) Batam city government accommodated in Work Plan and Budget (RKA) and Document of Budget Implementation (DPA) SKPD very high. Which means that existing programs on long-term planning are attempted to be accomplished one of them by accommodating the long-term programs to be incorporated into the work plan and the annual budget of Batam city government.

**Table 6.** Five Local governments with the highest rank on the principle of participation (2013-2015)

Year	Province	District / City	Score
2015	Prov. Kepulauan Riau	City of Batam	<b>3.570757</b>
2013	Prov. Kalimantan Selatan	District of Banjar	<b>2.75741</b>
2013	Prov. Sumatera Selatan	District of Komering Ulu Timur	<b>2.699443</b>
2014	Prov. Jawa Tengah	City of Magelang	<b>2.696311</b>
2013	Prov. Lampung	City of Bandar Lampung	<b>2.600045</b>

Meanwhile, based on the lowest scoring on the principle of participation during the year 2013-2015 obtained by the government of North Sumatra province, especially in Karo district government as can be seen in table 7. Even the Karo district government gets the lowest score for two years, 2014 and 2015.

**Table 7.** Five Local governments with the lowest rank on the principle of participation (2013-2015)

Year	Province	District / City	Score
2014	Prov. Sumatera Utara	District of Karo	<b>-1.77172</b>
2015	Prov. Sumatera Utara	District of Karo	<b>-1.34263</b>
2015	Prov. Riau	District of Bengkalis	<b>-1.31958</b>
2013	Prov. Jawa Tengah	District of Brebes	<b>-1.30927</b>
2014	Prov. Sulawesi Selatan	District of Toraja Utara	<b>-1.27933</b>

## 5 Conclusions, limitations, and recommendations

Based on the results of research analysis on the application of good public governance principles to the indicators contained in the IGI and EKPPD at the local government at the districts/cities level, the following conclusions are obtained. First, it proves some indicators related to GPG especially on the principle of participation that exist in IGI can be related to each other with EKPPD indicator because it has a meaning that is not much different. GPG scoring is very useful because it combines IGI indicators with EKPPD indicators so that less subjectivity. Because if the scoring is done without based on the indicators used in GPG assessments such as IGI, then the level of subjectivity is quite high. This assessment can be used by the central government to give the best GPG awards to local governments that get the best GPG scoring results. And for local governments that have poor GPG scoring results, through this research can be identified what components still need improvement. It is expected that further research can be developed and carried out in the form of a Forum Group Discussions (FGD) in order to further strengthen the validity of assessment instruments. In this case, the city of Batam



obtained the highest scoring results on the principle of participation, especially in 2015. Based on the results of Pratiwi & Sari (2017) research, the Batam city government has involved the community in the Musrenbang, but more involvement from the community is needed in the public service in Batam. Second, there is still no assessment of evaluation of GPG implementation especially in participation principle on local government conducted by central government. The central government's evaluation is still limited to performance evaluation, then the central government needs to make or develop an assessment of the application of GPG to local governments in Indonesia. Third, this study has not been able to present the scoring results of all local governments during the study period. This study is limited to the presentation of five local governments with the highest and lowest ranks in each year and during the study period. It is hoped that further research will be able to present the overall value more fully by presenting the scoring result to all local government in Indonesia during the research period so that it can be seen the scoring trend in every local government.

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## **The Influence Of Trust In Food Manufacturers As A Mediation To Perceptions Of Food Safety (Survey On The Tradisional Products In Yogyakarta)**

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**Abstract.** Perception of food safety is related to the raw materials used. Food safety is widely questioned regarding to social responsibility. This research aims: 1. To analyze trust in government that directly affects perception of food safety, 2. To analyze price perception that directly affects perception of food safety, 3. To analyze the Trust in government influence on perception of food safety mediated by trust in food manufacturers. 4. Price perception influence on perception of food safety mediated by trust in food manufacturers. Subjects in this research are the consumers of three products in Yogyakarta. The sample of this research is 75 respondents analysed by using Structural Equation Model (SEM) with PLS Program. The results of this research successfully prove that; 1. The trust in government directly affects perception of food safety, 2. Price perception directly affects perception of food safety, 3 Trust in government influence on perception of food safety was mediated by trust in food manufacturers. 4. Price perception influence on perception of food safety was mediated by trust in food manufacturers. The findings of this study may contribute to consumer behavior models, the food manufactures, the government and Tripple duties of Higher Education.

**Keywords:** *Trust in government, price perception, trust in food manufacturers and food safety perception*

### **1. Introduction**

The Management of consumer perception needs to be understood by marketers to avoid multiple interpretations between consumers with one another. The perception of each consumer often varies according to his/her knowledge and experience to assess a product or service. Consumer perception is a process of selecting, organizing and interpreting information about a product or service by consumers. In other words, perception is a process by which individuals choose, organize, and interpret stimuli based on previous experience [13]. In terms of perceiving goods and services which always appear in various views, the perception of a consumer cannot be negated by consumers who do not agree. Likewise, positive perception is not necessarily that other consumers are positive, they may have negative views. Food security perception is a very important aspect, it is hardly surprising that it appears on TV, news and talks about food safety in the community. This makes consumers more vigilant and careful looking for foods that are considered safe by consumers.

Currently, many UMKM products are developing in the form of home industries such as producing tofu, tempe and noodle that develop in the community without using labels sold in traditional markets.

Customers are consumers who often shop at traditional markets. These consumers are the consumers from all class status. Perception not only depends on stimuli in physical form, but also depends on the stimuli around them and the conditions that exist in a person and perception are more important than

reality in marketing, because perceptions that can influence consumers in behaving, other than that people can have different perceptions of the same object [10]. Referring to the behavior of decision-

making units to make continuous purchases of selected company goods or services. Consumers buying food are not just for the taste, but also must be healthy. One of them is by choosing safe raw foods.

The government needs to monitor food products made by food producers because the government has the authority to control food security. The government has food safety rules, the government has encouraged producers to certify, but there are still many who have not implemented that yet even though consumers who eat come from all class status. The power of the consumer confidence in the government and producers raises the perception of food security. Chen (2013) proves that the consumer confidence in the government can improve food security perceptions. The government is concerned about the health of consumers if food is not monitored regularly, causing concerns about the emergence of various diseases. The government provides correct information about food safety to consumers. The government always reminds consumers and producers to follow the information conveyed in terms of food safety. George (2006) Reasonable price, price compliance with the quality and price standardize. Food manufacturers have the knowledge of the safety of food products. Food producers must know the ingredients that need to be avoided, and producers must be responsible for the health of their consumers. Starting from the process of processing food products. Food producers must comply with the regulations related to food safety. Producers should distinguish what materials are forbidden to be used to ensure food safety. Honest food producers are about food safety, some producers honestly convey information to consumers, some are dishonest.

*b. The purpose of this research can be formulated as follow :*

1. To analyse the trust in government that directly affects perception of food safety
2. To analyze price perception that directly affects perception of food safety,
3. To analyse the trust in government influence on perception of food safety mediated by trust in food manufacturers.
4. To analyze price perception influence on perception of food safety mediated by trust in food manufacturers

## **2. Literature Review**

### ***2.1 The Relations between Trust in government and perception of food safety***

The importance of trust in risk management [6]. Trust in the government can improve food security perceptions [5]. Trust in government means that the government has the authority to control food security, government agencies have food safety rules, the government is concerned about the health of consumers and the government provides correct information about food safety to consumers. Trust can affect the perceived security of various food products [4].

### ***2.2 Price perception that directly affects perception of food safety***

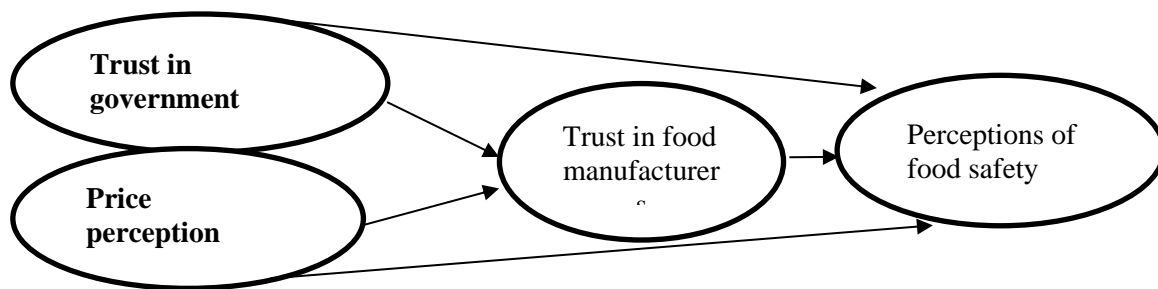
Price indicators are defined by four criteria reasonable price, low price compete, price compliance with the quality, price standardize [8] Beneke J (2014) perceived Price that directly affects perception quality.

### ***2.3 Trust in government influence on perception of food safety mediated by trust in food manufacturers.***

Trust is all knowledge and conclusions that consumers have about objects, attributes and benefits [6]. The trust in government influence on perception of food safety mediated by trust in food manufacturers [5]. Stefani et al. (2008) examined the mediating effects of specific beliefs and general beliefs on food risk perception.

### ***2.4 Price perception influence on perception of food safety mediated by trust in food manufacturers***

Perception is the expectation of consumers varying from one another, and have different levels of distance Zeithaml, Bitner, & Gremler (1988). Price perception influence on perception of food safety mediated by trust in food manufacturers [5]. Price perception affects trust [11].



**Figure 1.** Conceptual Framework

### Hypothesis

1. Trust in government that directly affects perception of food safety
2. Price perception that directly affects perception of food safety,
3. Trust in government influence on perception of food safety mediated by trust in food manufacturers.
4. Price perception influence on perception of food safety mediated by trust in food manufacturers

### 3. Methods

The populations in this study are all consumers at three traditional products in Yogyakarta; Tahu, tempe, and Noodle products. The samples were some consumers at three traditional product. The sample amount in this research is 75 respondents. This sampling technique was purposive sampling technique. Hypothesis testing is done by using model of Structural Equation Modelling with PLS (Partial Least Square) technique to test the influence of each variable. In this research, the instrument testing is done with validity and reliability testing. It is said to be reliable if the composite reliability score is  $\geq 0,6$ . The result of validity and reliability test in research is all of the indicators valid and reliable. (The expected result of this testing was all the indicators were valid and reliable).

#### a. Definision Operasional Variable

##### 3.a.1 *Trust in government*

1. The government has the authority to control food security
2. Government agencies have rules about food safety
3. The government concerns about consumer health
4. The government provides correct information about food security to consumers

##### 3.a.2 *Price perception*

1. Reasonable price
2. Price compliance with the quality
3. Price standarized

##### 3.a.3 *Trust in food manufacturers*

1. Food manufacturers have the knowledge of food product safety
2. Food producers must comply with the regulations related to food safety
3. Manufacturers must be honest about food safety

##### 3.a.4 *Perceptions of food safety*

1. Food raw material products
2. Traditional products
3. Food processing
4. Food for all people

#### 4 Research Result and Discussion

The Result of SEM on PLS program is shown as follows:

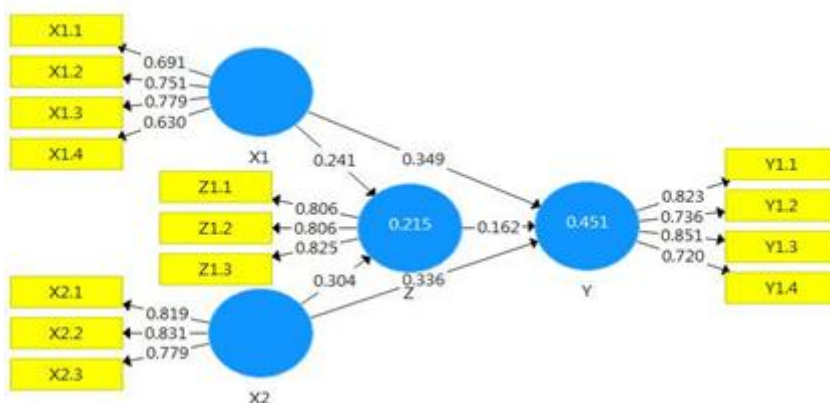


Figure 2. Algorithma

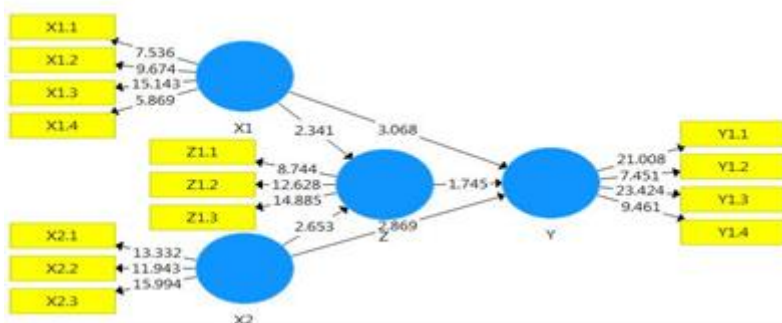


Figure 3. Bootstrapping

##### a. Hypothesis Test

4.a.1 *The test; The influence of antecedent perception of food safety variable. There are four tests as follows:*

**Hypothesis Test 1;** Based on figure 4.1 it can be seen that the *trust in government* effect directly the *perception of food safety* at path coefficient = 0,349, (P-value =0.000). It is said that *trust in government* has a positive effect towards *perception of food safety* (H1 is proven/ H1 is accepted). In the other words, by paying attention to *trust in government* related to the government has the competence to control food security, government agencies have food safety rules, the government is concerned about consumer health, the government provides correct information about food security to consumers so consumers tend to *perception of food safety*. This research result strengthens the prior research by Chen (2013).

**Hypothesis Test 2;** Based on figure 4.1 it can be seen that the *price perception* directly effect *perception of food safety* at path coefficient = 0,336, (P-value =0.000). It is said that *price perception* has a positive effect towards *perception of food safety* (H1 is proven/ H1 is accepted). In the other words, by paying attention to price related to reasonable price, price compliance with the quality, and standard price, so consumers tend to *perception of food safety*. This research result strengthens the prior research by George, et al (2006); Chen (2013); Beneke J (2014).

#### 4.a.2 *Trust in food manufacturers as a Mediation to perception of food safety*

##### **The trust in government influence on perception of food safety mediated by trust in food manufacturers**

After seeing the numbers, the analysis that trust in food manufacturers can not be determined to mediate Trust in government to perception of food safety. Trust in food manufacturers has not effect on perception of food safety (P-Value = 0.08 > 0.05). Trust in food manufacturers is related to a food manufacturers which have knowledge of food product safety, food producers must comply with regulations related to food safety and manufacturers must be honest about food safety. (H3 is not proven/ H3 is not accepted).

##### **Price perception influence on perception of food safety mediated by trust in food manufacturers**

After seeing the numbers, the arisen analysis that trust in food manufacturers can not be said mediate Trust in government to perception of food safety. Trust in food manufacturess has not effect on perception of food safety (P-Value = 0.08 > 0.05). Price perception is related to a reasonable price, price compliance with the quality and price standardize. (H4 is not proven/ H4 is not accepted).

In other words, the consumers have more trust in government than trust in food manufacturers. This research shows that trust in food manufacturers can not be said mediate Trust in government and price perception to perception of food safety. This finding is contradictory to previous research [5].

##### **Determination Coefficient (R square)**

Trust in manufacturers ( $R^2_1$ ) = 0,320  
perception of food safety ( $R^2_2$ ) = 0,422

##### *Q<sup>2</sup> predictive relevance*

$$\begin{aligned} Q^2 &= 1 - (1-R^2_1) (1-R^2_2) \\ &= 1 - (1 - 0,215) (1 - 0,451) \\ &= 1 - (0,68) (0,578) \\ &= 66,87\% \end{aligned}$$

$Q^2 = 66,87\%$  which means *Trust in government, Price perception, and trust in food manufacturers* contribute 66,67 % towards the perception of food safety in three traditional products. The rest which is 33,13% is affected by the others variable.

## **5 Conclusion**

- a. Trust in government directly affects perception of food safety
- b. Price perception directly affects perception of food safety
- c. Trust in government influence on perception of food safety was not mediated by trust in food manufacturers.
- d. Price perception influence on perception of food safety was not mediated by trust in food manufacturers

## **6 Suggestion**

This research indicates that Trust in government and price perception directly affects perception of food safety but trust in government and price perception influence on perception of food safety not mediated by trust in food manufacturers. In this case, increasing the trust in government is important for food safety, so that perception of food safety will raise. The trust in government related to the government has the authority to control food security, government agencies have food safety rules, the government is concerned about consumer health, the government provides correct information about food security to consumers. So does price perception is related to a Reasonable price, price compliance with the quality and price standardize.

A theoretical benefit of this study is that it can develop consumer behavior theory in trust in government` by creating the trust in government, the price, trust in food manufacturers, and perception of food safety. The practical benefit of this study is that the corporate can strategize the trust in government and the price perception. The benefits for the next researcher is as an opportunity to

conduct research on the same or different object, and other variables which give effect on perception of food safety.

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# **EDUCATION & TEACHING**

# University Students' Perception towards the Use of Duolingo Application in Learning English

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**Abstract.** This study aimed to investigate students' perception towards the use of Duolingo Application in learning English. This was a descriptive study. There were 135 university students in Pekanbaru, Riau, Indonesia participated in this research. The data were attained through students' questionnaires and students' interview. The findings revealed that students had an overall positive perception towards the use of Duolingo application in learning English. The findings from questionnaires described that 82.3% of the participants found the features in Duolingo was easy to use and 83.7% of them also agreed that practice English through Duolingo was convenient because they could communicate and access it anytime and anywhere. Then, 85.2% of the participants thought that Duolingo was helpful, 90.4% of them stated it was useful for improving their English skills and 91.2% of them agreed that Duolingo was effective to improve their English skills anytime and anywhere. However, it showed that 89.6% of them have positive attitude towards the use of Duolingo in learning English and over 60% of them also approved that Duolingo could develop their self-learning skill and encourage them to learn English. In addition, it also found that there were over 80% of the participants agreed that Duolingo could increase their motivation to learn and to practice their English skills. Finally, the finding described that overall means scores of each items from questionnaires' were in high level (3.51-4.50). Furthermore, according to the result from students' interview, there were several benefits and drawbacks towards the use of Duolingo in learning English. There were several benefits towards the use of Duolingo for example, this application as an adequate way to a new context learning, it could help the students in improving their English skills, the features of Duolingo was interesting and addictive, it could stimulate and motivate the students to learn English, the students felt comfortable and enjoyed learning English through the use of Duolingo. In other hand, there were also several drawbacks towards the use of Duolingo application that noticed by students namely they could not play and learn through the use of Duolingo in offline mode, they also found that there were unnatural sentences in the exercises in Duolingo, there were annoying advertisements in the middle of exercises, several repeated questions also found in the same level and there was no explanation related to the grammatical structures. These problems gave difficulties to the students in accomplishing the exercises and learning process. In conclusion, even though there were several drawbacks found in Duolingo, but the positive aspects of it still gave contribution to the students' learning process.

## 1. Introduction

Due to globalization era, taken together with the advancement of technologies make us possible to communicate and interact with people all over the world. These advances bring out new possibilities on the job market and for the economy, including in Indonesia. Furthermore, English become a prominent factor for university students after Asean Economic Community applied in 2015. English is not just an additional qualification anymore, but rapidly has become a prerequisite for a successful career. Thus, as university students they should concern to improve their English skills for their future career. Unfortunately, most of university students in Pekanbaru, Riau still have difficulties in learning English even they have learned it since in elementary school. Most of them only learn English in the classroom once a week and they seldom practice their English outside the classroom. In addition, they

are lack of vocabulary in English. It triggers them reluctant to use English in their daily life. Whereas, vocabulary plays an important role in learning a foreign language. It is one element that links the four skills of speaking, listening, reading and writing all together. Due to the limitation of vocabulary they have, sometimes students want to share their ideas, but they do not know how to express them, finally they choose to keep silent. Consequently, it also tends to make them become passive students. These conditions influence the students speaking ability, because they do not have opportunity to speak and practice their English. In addition, these problems could influence the student's motivation in learning English. They do not have motivation to learn English. Finally, all lecturers have responsibility to develop teaching method and teaching media so that we can increase the quality of our teaching and students too. We need to find a way to overcome this problem and to motivate our students in learning English not only in the classroom but also outside the classroom. Based on the researcher observation and interview, majority of students using smartphone and laptop in their daily life. They usually use their smartphone for making a call, sending message, playing games and checking social media. Many of them spend their free time by using their smartphone or online about 3-12 hours in a day. Often the researcher saw by her bare eyes, many students play games in their break time whether in a classroom or out of classroom. The researcher asked them about the convenient of playing games and they said that playing games is fun and addicted. They also feel challenged to battle with their peer. It means that they feel comfortable and relaxed in playing games.

In recent years, web-based games or educational games have increasingly supported learning. Many researchers and practitioners point out that games have a great educational value by offering students a fun and non-stressful learning atmosphere. It minimizes the student's anxiety in learning process. According to Chen (2005) games promote communicative competence, encourage creative and spontaneous use of language [1]. They are effective to increase motivation and promote learner centered. Games can promote the development of students' attitude and give them more chances to speak. Furthermore, Ewa (2016) argues that games have advantage of bring variety, breaking monotony, proving a thrill when doing grammar exercises and motivating students to work. However, the term gamification has been rising and growing popularity since 2010 [2]. According to Darina & Christo (2015) who state that gamification is potential to foster motivation, behavioural changes, friendly competition, and collaboration in different contexts [3]. Further, Werbach (2013) believes that gamification is the use of game elements and game design techniques in non-game contexts [4]. In this study, gamification is defines as the application of game elements into education which makes learning more relaxed, fun and comfortable for the students. Pappas (2015) defines gamification as a methodology that involves the use of game design elements and mechanics in learning activities [5]. This is done to motivate and engage the learners become active participants in their own learning process.

Based on the explanation above and analyzed the pilot studies, the researcher have an idea to look for an appropriate educational game for her students. There are variety application of educational games can be applied to support teaching and learning activities. However, it is necessary for the lecturer to guide them in choosing appropriate application of educational games which meet the students' need, meets the objective of the topics, and integrates into the existing curriculum. So that it can help students in improving their English skills not only in classroom but also outside classroom. Throughout the researcher's overview of several educational games application, she considered to apply a gamification method to her students' teaching and learning activities through browser-based and mobile application called Duolingo. It is a games application that can be used for the students not only to play but also to learn language. The essential point is it can motivate them to spend their free time to improve their English outside classroom. Duolingo is a freemium language-learning platform for cell phones or computers created by Luis Von Ahn and Severin Hacker in 2012. It offers 68 different language courses across 28 languages. According to its website, it has over 300 million registered users across the world. It is one of the most and praised language teaching application on the market. It has also won several awards as best education start up and play and learning application. Duolingo presents four English skills namely reading, writing, listening, and speaking. The four skills are present during the learning activities in Duolingo through questions, small texts to heard and transcribed. The students also have to record their pronunciation to assess their speaking ability.

Many experts have given their positive feedback related to the use of Duolingo in teaching and learning English. Krashen (2014) states that Duolingo application is a web-based self-paced language teaching program that guides students step-by-step through a sequence tasks, largely based on translation [6]. It is aimed as conscious learning and subconscious of language as students hear and read samples of language. Then, Munday (2016) states that Duolingo is very modern-looking gaming application [7]. Most of activities in the application are based on translation, dictation, and pronunciation. It also incorporates some gamification elements to motivate and engage learners. Some examples of this are the lingots as awards given when you complete a skill; the inclusion of a weekly learderboard, where you can “compete” against friends to see who has the highest XP; a symbol of a flame next to your name with the numbers of days of your streak on the site; the aforementioned strength bar, which appears when a user is completing a lesson, to indicate how close they are to finishing it, etc. Furthermore, White (2017) points out that Duolingo is an online learning program allows people take free language courses because they translate [8]. Realizing this phenomenon above, the researcher was encouraged to apply Duolingo Application in learning English to her students. Finally, the objective of this research was to investigate her students’ perception towards the use of Duolingo Application in learning English.

## **2. Method**

### *2.1. Method design*

This is a descriptive study, which aims to investigate students’ perception towards the use of Duolingo Application in learning English. The study uses a mixed-method design in terms of data collection. The major data sources consist of quantitative questionnaire and a qualitative semi-structured interview. It is line with Dornyei (2007:169) who state that a study that is characterized by a dominant quantitative style the supported by a follow-up interview can be categorized as a ‘QUANTITATIVE → Qualitative’ research [9].

### *2.2. Participants*

The study was conducted at several universities in Pekanbaru, Riau during the second teaching semester of the 2018 academic year. A total of 135 undergraduate students taking English Level II subject were purposively selected to participate in this study. They were consisted of 66 females and 69 male students. Their ages range were 19-21. According to CEFR it was B1 level.

### *2.3. Procedure*

This research was conducted for one semester or 14 meetings. Duolingo was used outside classroom to support face-to-face meetings in the classroom. At the beginning of the semester, the researcher introduced Duolingo to the participants. She asked all students to download Duolingo application into their smartphone and/or laptop. Then, the researcher guide the students how to play and learn English through Duolingo. At the next meeting the researcher arranged a website for Duolingo Classroom where all of the participants were registered to the link by entering the classroom code. After following Duolingo Classroom, the students’ acitivities and progress automatically recorded in Duolingo where this link only could be accessed and seen by the lecturer. Thus, the researcher could monitor all students’ activities because the researcher also received notification from Duolingo via email about the students’ progress in detail. Besides, it showed the information about the students’ assignment submission time. The researcher could know who submitted the assignment on time, late, or even did not submit her/his assignment in Duolingo. The researcher gave assignment every week on Duolingo and they would receive notification via email that they have assignment on Duolingo and which topic that they were going to accomplish based on the schedule given by the lecturer. Furthermore, the lecturer asked them to do another exercises on Duolingo. The lecturer kept monitoring the daily use of Duolingo by the students and encouraged them to use it at least 15 minutes in a day. She also suggested them to make class group on Duolingo, so that they could compete and communicate with another users easily. They could also see who got the highest score and become the leaderboard everyday. In addition, the students might open Duolingo on their laptop as long as they remember their username, password and synchronize to their device. At the end of the semester, the researcher gave questionnaire and interviews to the participants related to the use of Duolingo in learning English.

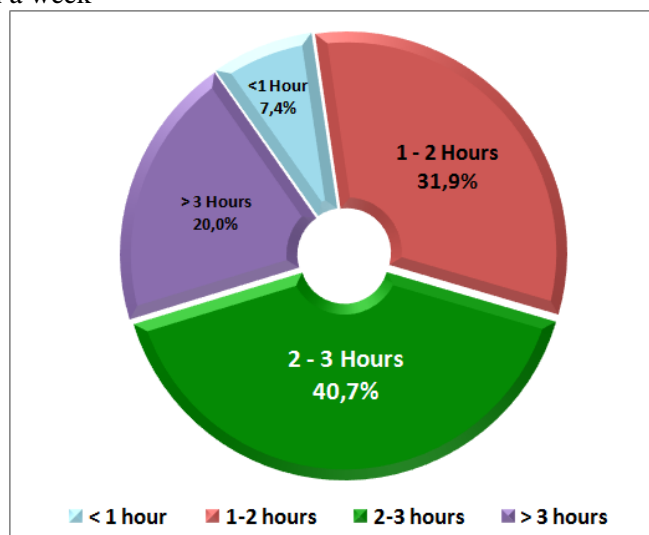
### 2.4. Data collection and analysis

The instruments used in this study were questionnaire and interview. The questionnaire was examined and validated by three experts. They checked the suitability of content and clarity instructions. They suggested to improve several items and also to delete unnecessary items. The questionnaire used five point Likert-scale. Each statement was answered from strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The questionnaire consisted of 24 items regarding students' perception towards the use of Duolingo application in learning English namely; easiness of using and learning English through the use of Duolingo, usefulness of learning English through the use of Duolingo, effectiveness and language improvement through the use of Duolingo, attitudes towards learning English through the use of Duolingo, and enhancing students' learning motivation through Duolingo. The students also filled survey about their learning duration through Duolingo. Furthermore, these data were analyzed quantitatively for means and percentages. The ranges were used for this data as follows: 1.00-1.50 = very low/very negative, 1.51-2.50 = low/negative, 2.51-3.50 = moderate, 3.51-4.50 = high/positive, 4.51-5.00 = very high/very positive. In addition, for investigating the students' perception towards the use of Duolingo Application in learning English more closely, students also interviewed in depth. The researcher interviewed 30 students, 10 students who were active, 10 students who were in moderate, and 10 other students who were passive in classroom. They were asked to tell about their thoughts on how Duolingo helps them in learning English, the benefits and the drawbacks of the use of Duolingo in learning English. The data from interview was analyzed qualitatively.

### 3. Finding and discussion

This study aimed to investigate the students' perception towards the use of Duolingo Application in learning English. Based on the survey, it reported that all of the participants have smartphone or android and 90% of them have laptop. They had been using them for 2-3 years. All of them also have Duolingo account on their mobile phone or laptop. In the beginning of the semester, the researcher or the lecturer suggested the participants to play and to learn in Duolingo minimum 15 minutes in a day. In fact, there were several participants (7.4%) did not open Duolingo as suggested by the lecturer. Fortunately, there were many students played and learned through the Duolingo more than 15 minutes in a day or >2 hours in a week (60.7%). The other details can be seen in Figure 1.

**Figure 1.** Percentage of learning duration of using Duolingo in a week



According to the questionnaire, the findings showed that the students were positive towards the use of Duolingo application in learning English. All of the mean in each items were in high level (3.51 – 4.50). The detailed results could be shown from the following tables.

**Table 1.** Easiness of using and learning through the use of Duolingo

No	Questions	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
		%	%	%	%	%	
1	I think Duolingo is easy to access whether from my mobile phone or laptop.	0,0	1,5	6,7	53,3	38,5	4,3
2	I feel Duolingo features is easy to use and to interact with other users.	0,0	1,5	16,3	55,6	26,7	4,1
3	I think it is convenient to practice English through Duolingo since I can access it anytime and anywhere.	0,0	0,7	15,6	44,4	39,3	4,2

From the table 1 we can see the combination of the strongly agree and agree results we acquired from questionnaire, we find that 91.8% of the participants think Duolingo is easy to access whether from mobile phone or laptop, 82.3% find the features in Duolingo is easy to use and to interact with other users, and 83.7% agree that practice English through Duolingo is convenient because they can communicate and access it anytime and anywhere. In other words, the participants do not have any problems related to the features and the access of Duolingo in learning English.

**Table 2.** Usefulness of learning English through Duolingo

No	Questions	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
		%	%	%	%	%	
1	I think Duolingo features are variative, interesting and useful.	0,0	2,2	15,6	54,8	27,4	4,1
2	I feel Duolingo gives me opportunities to enhance my English outside the classroom.	0,0	0,7	6,7	42,2	50,4	4,4
3	I think Duolingo is helpful to improve my English skill.	0,0	0,7	14,1	58,5	26,7	4,1
4	I feel Duolingo is useful to practice my English skill.	0,0	1,5	8,1	57,8	32,6	4,2

Table 2 demonstrates that Duolingo application is useful in learning English at several aspects. Almost half of the participants agree that Duolingo features are useful, convenient and fun. Then, more than 50% strongly agree that Duolingo gives them opportunities to enhance their English outside classroom. Besides, 85.2% of them also agree that Duolingo is helpful and 90.4% of them state it is useful for improving their English skills (combination results from agree and strongly agree). It means that most of the students feel that Duolingo can be used to enhance their English outside classroom at anytime and anywhere.

**Table 3.** Effectiveness and language improvement through the use of Duolingo

No	Questions	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
		%	%	%	%	%	
1	I think Duolingo is an effective way to improve my English anytime and anywhere.	0,0	1,5	7,4	55,6	35,6	4,3
2	I practice reading and writing through Duolingo.	0,0	0,7	18,5	63,7	17,0	4,0
3	I practice listening and speaking through Duolingo.	0,0	2,2	18,5	61,5	17,8	3,9
4	I learn grammar or structure through Duolingo.	0,0	3,7	25,9	57,8	12,6	3,8
5	I practice translating words and sentences through Duolingo.	0,0	3,0	20,0	49,6	27,4	4,0
6	I think Duolingo enrich my vocabulary.	0,0	0,7	15,6	42,2	41,5	4,2
7	I believe that my achievement is possible to increase after the use of Duolingo.	0,0	4,4	28,1	57,8	9,6	3,7

Thus, Table 3 reveals that more than half of the participants agree that Duolingo is effective to improve students' English skills anytime and anywhere. They also state that it can be used as a media for practicing their reading, writing, listening and speaking skills. Besides, they can also learn grammar and translating through Duolingo. Another point is 83.7% agree that it can enrich their vocabulary. Finally, only 67.4% of the participants believe that it could possible to increase their English ability after the use of Duolingo. There are more than 30% of the participants who do not believe it could increase their achievement. Moreover, majority of them still expect that it is effective to improve their achievement in learning English.

**Table 4.** Attitudes towards learning English through the use of Duolingo

No	Questions	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
		%	%	%	%	%	
1	I think doing assignment through Duolingo is more fun than conventional way.	0,0	0,7	23,0	60,7	15,6	3,9
2	I think using Duolingo develop self-learning skills among students because we can measure our progresses on Duolingo.	0,0	3,0	36,3	49,6	11,1	3,7
3	I feel learning English through Duolingo makes is more interesting.	0,0	0,0	15,6	45,9	38,5	4,2
4	I have positive attitudes towards learning English through Duolingo.	0,0	0,7	9,6	52,6	37,0	4,3
5	I think using Duolingo makes learning English is easier.	0,0	1,5	11,1	67,4	20,0	4,1
6	I feel Duolingo encourages me to spend more time in learning English.	0,0	2,2	19,3	53,3	25,2	4,0
7	I enjoy when I am learning English through Duolingo.	0,0	1,5	5,9	48,9	43,7	4,3

Table 4 describes that more than 60% of the participants think that doing assignment through Duolingo is more fun than doing assignment on paper, 60.7% of the them approved that Duolingo develop their self-learning skills because they can measure their progresses day by day, 84.4% also feel that Duolingo makes learning English is more interesting. Then, 89.6% of the participants have positive attitude towards the use of Duolingo in learning English. However, more than half of the participants also think that using this application make learning English more easily. Finally, majority of the participants state that they enjoy when they are learning English through the use of Duolingo.

**Table 5.** Enhancing Students' learning motivation through the use of Duolingo

No	Questions	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
		%	%	%	%	%	
1	I feel motivated to play Duolingo when I find my friends get higher score than me.	0,0	3,7	28,1	58,5	9,6	3,7
2	I feel Duolingo can increase my motivation in learning English.	0,0	1,5	6,7	60,7	31,1	4,2
3	I feel motivated to practice my English skills through Duolingo outside classroom.	0,0	3,0	9,6	65,9	21,5	4,1

Table 5 shows that half of the participants feel motivated to play Duolingo when they know their friend or the other users get higher score. Furthermore, there were 91.8% of the participants feel that Duolingo can increase their motivation in learning English and 87.4% of them feel motivated to practice their English skills outside the classroom through the use of Duolingo.

Furthermore, after collecting and analyzing data from interview, the researcher found various responses from the students about their thoughts towards the use of Duolingo for learning English. Several students describe about the positive aspects and the benefit of using Duolingo in learning English as following:

1. "I think Duolingo is great educational games application because it is free software in learning English. Then, this application is flexible because can be played and learned anywhere and anytime. Besides, it is user friendly and compatible for many devices. Everybody can play and learn through the use of this application easily".
2. "I think the use of Duolingo in learning English is an adequate way to today's context. It could stimulate and motivate me in learning English. Through the use of Duolingo I could practice listening, speaking, writing, and reading in practical and fun way. I can also learn grammar through Duolingo, there are many examples of part of speech and language structure on the questions given. I can understand how to arrange statement in English, how to pronounce words or sentences correctly, translate phrase, and so on. I think Duolingo makes me more adept than before, it really helps me in learning English".
3. "I think duolingo help me a lot in learning English because it can enrich my vocabulary. I know many new vocabularies after finishing the lessons on Duolingo because there are many kinds of topics in duolingo, namely; part of speech, adverb of time, education, technology, economics, politics, etc".

4. "I think this game is pretty complete. I can set the daily goal setting. The level is from basic or casual, regular into serious or difficult. The higher the level, the harder the games will be. Besides, this game also better to sharpen my brain than another kinds of games because I get many knowledge and information about English".
5. "I think Duolingo helps me in writing and pronouncing words or sentences in good and correct way. By using Duolingo my vocabulary is getting more and more. It makes me more interested to learn English independently because it gives me instant feedback by showing information about my progress and my level. I also can play and learn anywhere and anytime".
6. "I like the display of Duolingo. There are many kinds of features on Duolingo namely the points, badges, leaderboards, avatar, theme and so on. This application provides pictures and voice in learning which helps me in improving my pronunciation. It also has voice recognition software so that it can detect whether my pronunciation is already correct or not".
7. "The interesting point in Duolingo, I can make a group and have follower. I can compete with the groups' member or the other users to grab the highest points. I can also see my followers' level, points, and comments that appeared on a 'leaderboard' list. But, this is reset once a week (on Sunday)".
8. "I think Duolingo also teach me become discipline learner because it always reminds me to study every day. When I do not play it in a day, I will get reminder or notification via email from Duolingo and encourage me to play it and improve my English skills".
9. "I feel happy when I am playing Duolingo. Furthermore, I feel proud when I become the leaderboard on the group player. If I could answer the questions, I can collect point and get 'lingots', the currency that Duolingo uses to reward its users. With this lingots I can buy something like some outfits for the mascot etc. This is funny and playful way of learning English".
10. "I like Duolingo because I can learn English while I am playing the games. I feel relax so that I can learn English easily. There is no mental burden in learning or the fear of making mistakes in public eyes".
11. "This application is addictive. I can choose the topic that I want to play based on our ability so that it motivates me to increase my score. I am curious about the next levels' questions and what I have to accomplish to reach another level. Each level is always challenging for me. Thus, I want to play it more and more".

However, several findings above were in line with Anna et.al (2016) who state proved that Duolingo contributed to increase their student's vocabulary, pronunciation and grammatical structures [10]. Besides, they also found there was a significant increase in students' confident and effectiveness of themselves when trying to communicate in English. Next finding also congruent with Zita and Ruta (2017) who point out there three positive aspects of Duolingo [11]. First, it offers a goal-setting tool which can vary to use, depending on students' learning motivation and their goals to reach the best result. Second, it could encourage learner's motivation by earning 'lingots' (virtual currency of Duolingo) which can be used to reward the learner's achievement related to language learning. In addition, Duolingo another supportive tool is badges which display a student's completion or achivement of the level. It effectively stimulates the intrinsic motivation in relation to progress and mastery while learning a language. These statements were correct as the findings of the researcher in this study towards the use of Duolingo on her students' in learning English.

Furthermore, the students also give their comments about the drawbacks of the use of Duolingo in learning English, as follows:

1. "I cannot play Duolingo in offline mode, so I have to turn on the internet data if we want to open the application. So, I cannot open it when I do not have internet package. I think it would be better if this application can upgrade and add offline feature".
2. "I find there are several grammatical structures seemed unnatural and weird in conversation. For example, "My friend introduced me to my husband". This sentence sounded weird for me".



3. "Sometimes I find several questions are repeated in the same level. It makes me bored because I have known the answer from the previous number. I think it makes me easier to finish it. I expect this application can improve the questions and add more challenging topics".
4. "I find there are many advertisements appear on that application. After I finish one level, there will be an advertisement come out. Sometimes these can bother my concentration in playing and learning English".
5. "I find there is no explanation or reason why my answer is wrong especially on grammar or structure exercises. I think if there is a note about the best answer within the explanation, it will be better because it can give me more knowledge".

In conclusion, even though there were several drawbacks of the use Duolingo in learning English, the positive aspects of it still gave more benefits to the students' learning activities. Finally, the result from questionnaire and interview described that majority of the students have positive perception and attitude towards the use of Duolingo application in learning English. They agree that it is an effective way to improve their English skills and their motivation in learning English. This findings in line with Mulya and Refnaldi study (2016) who agree that Duolingo has interesting features that can increase students' interest and motivate them to learn English [12]. Another findings also proved that educational game applications have positive effects on students' ability. It is congruent with Hyungsung (2012) who states that the positive effect of educational games is it can promote students' academic achievement through special subject education which support by selected games [13]. Then, the students' general abilities namely self-efficacy, problem solving, decision making, logical thinking, creativity, communication and so on can be developed by playing games. In addition, Tory in Anna (2016) describes that the educators and the students themselves are discovering the virtual resources can be excellent support face-to-face activities. It means that this application could help the students' learning process which contribute to the students' achievement.

#### 4. Conclusion

This study aimed to investigate students' perception towards the use of Duolingo application in learning English. The findings of this research was the students have positive perception towards the use of Duolingo in learning English because it has many benefits to support students' learning process. This application could increase students' English skills and motivate them in learning English. They also felt comfortable and enjoyed learning English through the use Duolingo. Furthermore, majority of the students agreed that using Duolingo in learning English was an effective and interesting way. The finding also described that overall means scores of each items from questionnaires' were in high level (3.51-4.50). However, there were several drawbacks of the use Duolingo in learning process, for example the unnatural sentences, annoying advertisements, repeated questions, and lack of grammar guide. We expect this problems could be overcome in the near future. Finally, the researcher recommends and suggests to other researchers to use Duolingo in their students' teaching and learning activities due to its benefits. She also suggest to other researchers to continue this study based on the drawbacks of this application.

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# Character Education Model for Primary School Students based on Javanese Ethnolinguistic

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**Abstract.** The objective of this research is to find out the character education model for primary school students based on Javanese ethnolinguistic. Research method was using R & D. The subjects of the study were 4 teachers of grade five of primary school and 104 students of grade five of primary school. The informants are the school principal, lecturer of Javanese department, Primary School Teacher Education Department lecturer, Head of UPTD Pendidikan, low grade teachers, parents and school committee. Data collection techniques used observation, FGD, and indept interviews, documents and questionnaires. The technique of data validity was using data triangulation and data analysis techniques was using nvivo. The results show that the implementation of character education for primary students is done through integration in a number of subjects, habituation, extracurricular, and in various races. Each primary school has its own way to instill the character values of its students. While the character education model for primary school students which is based on Javanese ethnolinguistic proved to able to form the character of the students. This can be seen from the improvement of posttest result, observation result and documentation result of student behavior. The conclusion is that the implementation of character education should be done since primary school age by involving various components of both family, school and community.

## 1. Introduction

Character education is not a new thing in the history of mankind. Parents tried various ways to educate their children to be a good child in accordance with the accepted values and norms in the culture [1] [2] [3] [4]. Today, when science and technology play a major role in determining the welfare of a country, formal education institutions i.e. schools are expected to contribute more in the mastery of science and technology. As a result, schools are now focusing more on developing the ability to master science and technology that are growing rapidly. Unfortunately, the efforts to develop the mastery of science and technology is not accompanied by the efforts to improve character education [5].

There are several factors that cause less attention to character education in schools in Indonesia. There are some global factors, and some are local [6]. The global causal factor that there is less attention to character education which is closely related to the emergence of the industrial revolution that began in the 18th century in England which then extended to countries in Europe ,America, Japan and to the whole world. The industrial revolution was driven by the human ability to create machines that were originally driven by steam power. So that human and animal power is replaced by the power of the engine. The way of thinking in managing the factory is then applied in school. School is seen as a machine / factory, and the result is creating a school model which is separated from real life. This school is authoritatively administered whose main orientation is to produce a standard product, that is, the labor for the industry at that time. The school model in the industrial revolution era is not only changed the students learning style but also changed the teaching materials. The main characteristic of this school model is that it has a strong tendency to create uniformy, mechanistic and view students as objects only.

While the local factor is that a debt-centered development which seems to be based on the assumption that the material can replace everything including education, work ethic and increasingly marginalized

honesty. Moreover economic development is too dependent on natural resources and the fact that education only sees on the surface only. The underlying factors that become drivers and for the society to reach a high level of competence is avoided. These factors include high spirits, commitment to excellence, enthusiasm for continuous improvement, open minded to new possibilities and the courage to try new things.

Character education in schools should be instilled from the most basic level of primary school (SD). Primary School is the first formal education level that determines the student potential development. Therefore, inappropriate method in moral values education for primary school will have a long-term impact on the moral of the individual. The failure of character education because the school is still focus on teaching moral knowing and moral training but does not touch the moral of being the habit of students to continue to do moral deeds. In order to create moral being on students it is certainly needed a classroom atmosphere and a conducive school environment so that the moral value is applied. Schools are required to become institutions that cultivating moral values, and not only as moral teaching institutions and moral training institutions. Therefore, the character education content of schools should psychologically include the moral dimensions of reasoning, moral feeling and moral behaviour [7].

The Implementation of character education in schools as a medium of cultural values and norms that exist in society requires a separate model. The model should match the cultural conditions around the school. For instance, the character education models in primary students in Central Java Province which is famous for its noble culture. One of the Javanese cultural identity is the Javanese language. Javanese language is full of values and norms. The facts show that many students who are cultured in Java can not speak Javanese well [8] [9]. And morer, many of them do not understand the values and norms behind the Javanese language.

In the previous research, it has shown that the Javanese language has a dominant role in the student character education. In the Javanese language there are various rules that tie and restriction to the user so as to provide control in the process of self-control. In addition to Javanese language, there are many other Javanese literature that can be used as a medium of character education. This will be very easy for primary school students who are developing language [10].

The science that studies the language system in a cultural perspective is ethnolinguistic. Ethnolinguistics is also called linguistic Anthropology which is a study of language and culture as a major sub-field of Anthropology. There is also a claim that linguistics Anthropology is a branch of linguistics that examines the relationship between language and culture in a society [11]. Based on the description, it is necessary to develop character education model for primary school students based on Javanese ethnolinguistic.

## **2. Method**

### *2.1 Research Methods*

This research uses qualitative and R & D methods. Qualitative methods were used to identify the implementation of character education in primary school, while R & D was used to find character education models for primary school students based on Javanese ethnolinguistics.

### *2.2 Place and Time*

This study takes place in SD N Tambahrejo 1 (with the characteristics that many students' parents who become overseas migrant workers, so there is lack attention on children ), SD N 2 Sukorejo (with students' environmental characteristics as sub-urban areas, thus it is less social control) , both primary schools are located in Kendal District, SD N 2 Sekaran (with location characteristics close to the campus, so that a lot of student behavior affected by the character of college students), SD N 2 Ngijo (with rural location characteristics that still maintain the customs and culture) located in Semarang City. The research time is from 2017 to 2018.

### *2.3 Method of Collecting Data*

The subjects of the study are students and teachers of grade V SD N Tambahrejo 1, students and teachers of grade V SD N 2 Sukorejo (Kendal District), students and teachers of grade V SD N 2 Sekaran, students and teachers of grade V SD N 2 Ngijo (Semarang City) . More detail description can be seen in the following table:

**Table 1.** Research Subject

No	Research Subject	Total
1.	Student Class V SD N Sekaran 02	27
2.	Student Class V SD N Ngijo 02	23
3.	Student Class V SD N 2 Sukorejo	29
4.	Student Class V SD N 1 Tambahrejo	25
5.	Teacher Class V SD N Sekaran 02	1
6.	Teacher Class V SD N Ngijo 02	1
7.	Teacher Class V SD N 2 Sukorejo	1
8.	Teacher Class V SD N 1 Tambahrejo	1
9.	<b>Total</b>	<b>108</b>

In this study the informants were the school principal, educational expert, scientific community and public in general. The data obtained was in the form of information that supports research, especially about the character education model for primary school students based on Javanese ethnolinguistic. For more details it can be seen in the following table:

**Table 2.** Informant

No	Informant	Total
1.	Headmaster of SD N Sekaran 02	1
2.	Headmaster of SD N Ngijo 02	1
3.	Lecture of Pendidikan Bahasa dan Sastra Daerah FPBS UPGRIS	1
4.	Lecture of PGSD FIP UPGRIS	1
5.	Head of UPTD Pendidikan Kecamatan Gunungpati	1
6.	Teachers	2
7.	Parents of Students	2
8.	School Committee	1
	<b>Total</b>	<b>10</b>

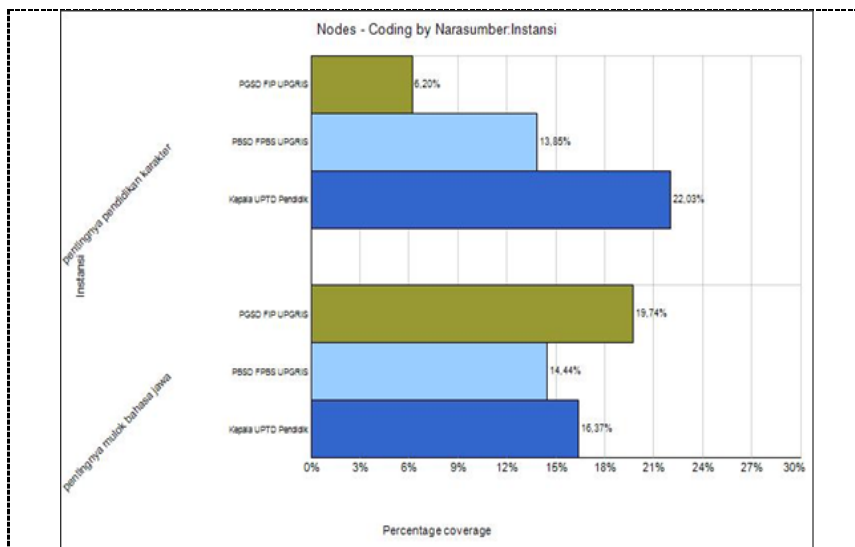
Data collection includes primary data and secondary data. Primary data sources were obtained from research subjects and informants. While the secondary data were obtained from reports / publications from relevant agencies and supporting data. Data collection techniques were observation, interview (indept interview to obtain data from research subjects, while Focus Group Discussion was used to obtain data from informants), documents and questionnaires (used to obtain data from research subjects and informants).

#### 2.4 Data validity techniques

The technique of data validity was using data triangulation. The triangulation technique used in this research is the examination technique by utilizing the use of source means to compare and check the feed back the on the degree of trust on information obtained through different time and tools.

#### 2.5 Data analysis method

Data analysis technique using nvivo analysis technique that is by using software commonly used for qualitative research. Here is one of the results of the nvivo analysis:



**Figure 1.** Data Analysis from informant by using nvivo

The picture above shows that of informant’s answer about the importance of character education for primary students from PGSD lecturer FIP UPGRIS as a character education expert in primary school 6.20%, from lecturer PBSO FPBS UPGRIS as Java ethnolinguistic expert 13.85% and from head UPTD Education of Gunungpati sub-district is 22.03%. While the importance of local content of Java language for primary students, the answer lecturer PGSD FIP UPGRIS of 19.74%, from lecturer PBSO FPBS UPGRIS of 14.44% and from Head Education Education UPTD Gunungpati of 16.37%..

### 3. Results and Discussion

School and environments affect the character building on children, both from social, cultural and economic factors. Similarly, the environment of SD N 2 Sukorejo, SD N 1 Tambahrejo is located in Kendal and SD N Sekaran 02, SD N Ngijo 02 is located in the city of Semarang. Each environment has its own characteristics, both from the heterogeneity of its people, its culture, its economic status, its religion, and its pattern of social interaction.

#### 3.1 Implementation of Character Education in Primary School

The implementation of character education for primary students is done through several activities, among them are integrated in a number of subjects such as Religion, PPKn, Bahasa Indonesia, and local content of Java Language; habits, such as marching before class, praying at the beginning and end of the lesson, singing the national anthem at the beginning of the lesson, the flag ceremony; extracurricular, for example in extracurricular scouts, drumband; and in various races, such as Islamic macapat race, race geguritan, etc. Each primary school has its own way to instill the characters' values in their students. Implementation of character education in the fourth primary school is still experiencing some obstacles, for more details can be seen in the following table:

**Table 3.** The Constraints on Implementation Character Education

No	Problems	SD N Sekaran 02	SD N Ngijo 02	SD N 2 Sukorejo	SD N 1 Tambahrejo
1.	Knowledge and implementation of character education by teacher	Most teachers have a good knowledge of character education for primary students, including in everyday practice, this is proved by the example of the teacher, for example, time discipline, clothing discipline, etc.	Limitations of supporting facilities and infrastructure.	Most teachers have a good knowledge of character education for primary students, including in everyday practice, this is proved by the example of the teacher, for example, time discipline, clothing discipline, etc.	Most teachers have a good knowledge of character education for primary students, including in everyday practice, this is proved by the example of the teacher, for example, time discipline, clothing discipline, etc.
2.	Social and Cultural Environment	The social and cultural environment around SD N 2 is now less conducive in supporting the implementation of character education for its students. Because of its location around the campus area makes students a little more affected by student culture. Facts on the ground indicate that some students are affected by bad associations of college students, such as those who are already smoking, speaking disrespectfully (such as using obscene words, calling friends with the term "ndes", which in Javanese is derived from the word "gondes" which means "gondrong ndeso", etc).	Rural environment gives a positive effect for the implementation of character education on students, only the implementation is less than the maximum.	The socio-cultural environment of the heterogeneous community makes the students have different character, the implementation of character education in schools experienced some obstacles, so that less than the maximum.	Socio-cultural environment is paguyuban, support for the primary of character education in schools.
3.	Facilities and infrastructure	Limitations of supporting facilities and infrastructure.	Limitations of supporting facilities and infrastructure.	Facilities and infrastructure are adequate.	Facilities and infrastructure are adequate.

Most of the constraints on the implementation of character education in schools are influenced by the cultural environment and infrastructure facilities that are less supportive. The neighborhood around the school sometimes has a negative effect on the students' character development. In the process of student development, the environment is one of the most important factors after carriage. Without the support of environmental factors, the process of development in realizing the innate potential becomes a real ability will not happen. Therefore, the function or role of this environment in the development process

can be said as a teaching factor, which is the factor that will affect the embodiment of a potential on becoming good or not, because the influence of the environment in this case can be positive which means good influence and strongly support the development of a potential or is negative i.e. the influence of the environment is not good and will hinder / undermine the development of students.

Facilities and infrastructure factors can support the realization of the process of character education adequate in schools. Implementation of character education in schools in addition to the stance of attitudes, the habituation of positive behavior, the integration of values in various subjects is also required conditioning the school by providing adequate facilities and infrastructure so as to support the development of character education students. The preparation of facilities and infrastructure in character education depends on the value of the character that is to be developed in the school, because each character value requires special facilities and infrastructure so that the character education success indicator in the school can be achieved well.

### 3.2. Character Education Model for Primary School Students based on Ethnolinguistic Javanese

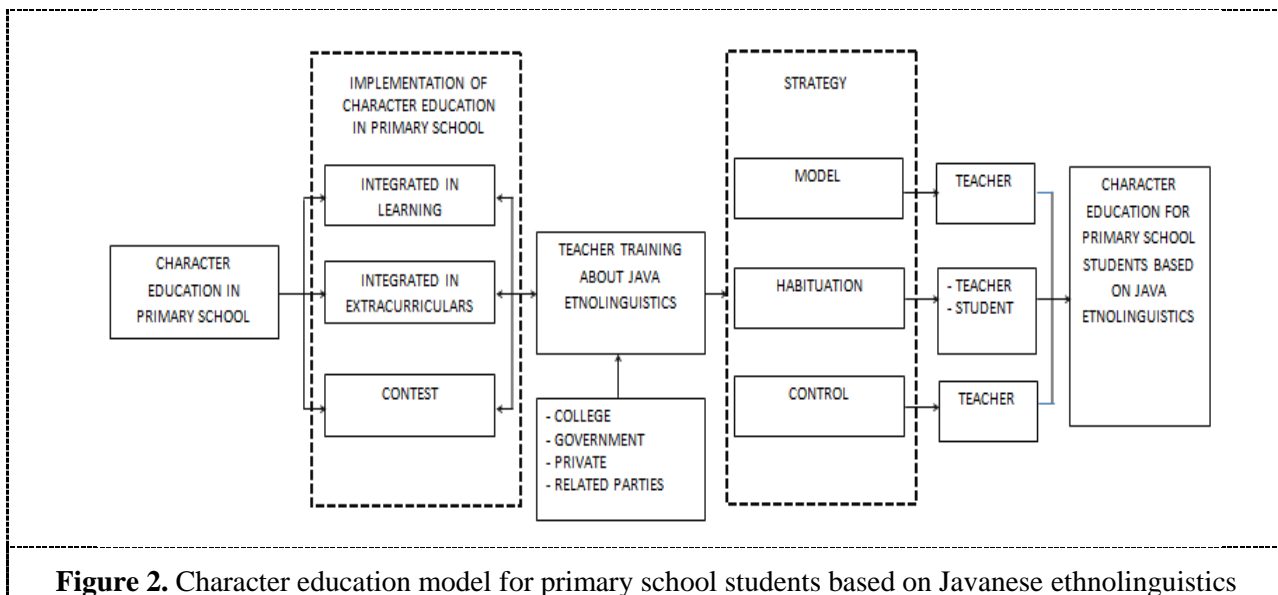
The character education model for primary school students based on Javanese ethnolinguistics was developed through several stages according to Borg & Gall, as follows:

**Table 4.** Stages of Character Education Model Formation for Primary School Students  
 Ethnolinguistic Based Java

No	Phase	Description
1.	Potentials and problems	Identifying various potentials and problems in the field, such as: identifying potentials and problems that arise when character education is conducted in all four primary schools, namely SD N Sekaran 02, SD N Ngijjo 02, SD N 2 Sukorejo and SD N 1 Tambahrejo. Each primary school has the potential and problems of implementing different character education.
2.	Data collection	Collecting data in the field, which will be used as initial capital / product design materials, such as students characteristics in the fourth primary school, the strategy of character education implementation in the fourth primary school, the constraints that arise, the teacher's effort to face the constraints,
3.	Product design	After data collection in all four primary schools, the product design is done, which is to create character education model for primary school students based on Javanese ethnolinguistic
4.	Design validation	Validate model design through expert / expert, ie Java ethnolinguistic expert from Javanese lecturer and character education expert on primary school students from PGSD lecturer
5.	Design revision	Tested a model design that has been validated by an expert to all four students and teachers in all four primary schools
6.	Product trial	After the design revision is done in accordance with the needs in all four primary schools then the model test has been revised
7.	Product revision	The test results are used as a tool to revise the model
8.	Test usage	The model was re-tested on all four primary schools
9.	Product revision	The test results are used as the basis for revising the final model
10.	Mass production	Disseminate the final model

The following is a "Character Education Model for Javanese Ethnolinguistic Primary Students" after going through the ten stages according to Borg & Gall:



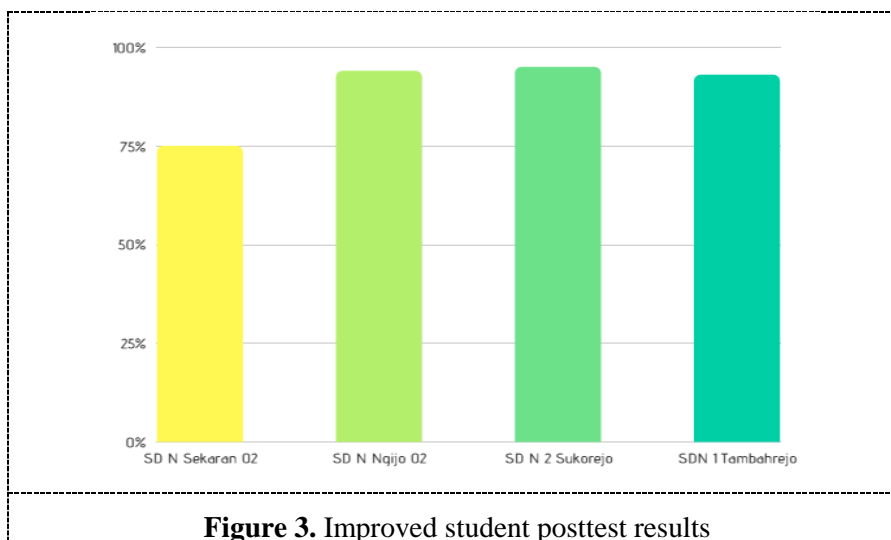


**Figure 2.** Character education model for primary school students based on Javanese ethnolinguistics

The picture above shows that the implementation of character education in primary schools that has been done through three ways, namely integrated in teaching and learning activities, integrated in extracurricular and through various kinds of competitions followed by students. While the character education effort for primary school students based on Javanese ethnolinguistic is done by giving training to the teacher about the ethnolinguistic material of Java. Giving this material is done because not all primary teachers know and understand the material on Javanese ethnolinguistics. In primary level, this material is given as local content subject of Regional Language i.e .Javanese Language. The learning materials of Java language in grade V SD students includes Java language, wayang story, Javanese script, legend, geguritan, and macapat song. Based on the results of research, most of the material that is not mastered by the teacher is the script of Java and tembang macapat. The lack of knowledge and skill of the teachers makes the teacher reluctant to teach Javanese script material and macapat song. This training can be provided by various parties namely universities, government, private or other parties who are competent. The strategy of transmission to students is done by modeling the attitude of the teacher, the habituation of various values of the positive character to the students and the supervision of the students' behavior by all school residents, especially teachers. The success of character education for primary students based on Javanese ethnolinguistics depends on the commitment of all components involved. Especially teachers who spearhead the implementation of character education [12] [13] [14].

### 3.3. *The Effectiveness of the Implementation of Character Education Model for Javanese-based Primary School of Ethnolinguistic Students*

Character education model for primary school students based on Javanese ethnolinguistics proved to be able to build students character. This can be seen from the improvement of posttest result, observation result and documentation result of student behavior. Here is an increase in posttest result of students in all four primary schools:

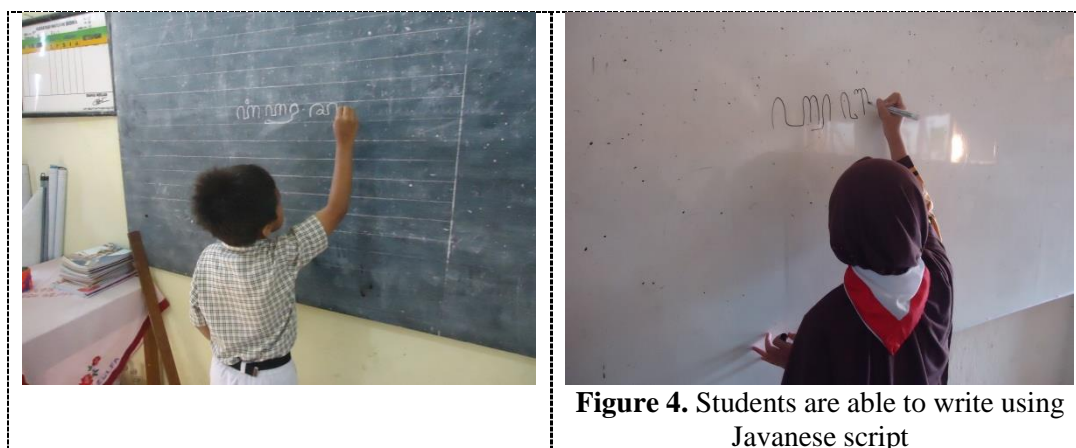


**Figure 3.** Improved student posttest results

Students are asked to do a number of questions before and after the character education activities for primary school students based on Javanese ethnolinguistics. The question is in the form of pretest and posttest with the same material. The subject matter includes knowledge and skills of Javanese language, knowledge and skill of writing “aksara Jawa”, knowledge and skill of “tembang macapat”, knowledge of “geguritan”, and knowledge of “wayang” story. The learning of Java language in SD includes writing, reading, listening, and speaking [15]. The “aksara Jawa” is a Javanese letter of 20 core characters complemented by the use of “sandhangan” and “pasangan” in forming a word or sentence [16]. “Tembang macapat” contains sublime meanings that are often used as expressions that are expressed in a paragraph. “Tembang macapat” often used as a depiction of life which also contains advice or good advice to live life. “Tembang macapat” consists of eleven types or titles. Eleven types of songs in this “tembang macapat” each have different characteristics and character [17]. “Geguritan” is a modern Javanese poetry [18].

The result is as seen in the picture above, i.e. there is an increase of pretest results to posttest in each primary. At SD N Sekaran 02, the increase of posttest result was 75%, SD N Ngijo 02 increased 94%, SD N 2 Sukorejo was 95% increase and SD N 1 Tambahrejo was increased by 93%.

Here is a picture of the results of observation and documentation on the effectiveness of character education for primary school students based on Javanese Ethnolinguistics:



**Figure 4.** Students are able to write using Javanese script

The picture above shows the students' ability in writing Javanese script. Students who initially had low knowledge and ability in writing Javanese script can improve their knowledge and ability to write Java script properly. In addition students also have knowledge about the various kinds of “tembang macapat”

as well as able to sing “tembang macapat”. In grade V SD taught in the second semester, with core competencies "Understanding the factual and conceptual knowledge by observing and trying (listening, seeing, reading) and questioning based critically about himself, God's creatures and activities, things he encounters at home, school and playground ", while his basic competence" Understanding the song "Pangkur" with the following material:

**PANGKUR**  
 slendro pathet 9

1 2 2 2 | 2 2 32 1.6  
 Mang-ko- no ngel - mu kang nya - ta

6 1 2 2 | 1 6 1 6 6 5 5  
 sa - nya - ta - ne mung weh re - sep - ing a - ti

2 5 6 6 | 6 6 65 6.1  
 bu - ngah i - nga - ran - an cu - bluk

5 2 2 | 2 2 32 1.6  
 su - keng tyas yen den i - na

6 1 1 1 | 6 6 6 6 | 6 1 1 1  
 no - ra ka - ya si pung- gung ang - gung gu - mung-gung

5 6 6 6 | 6 6 61 6.5  
 u - gung-an sa - di - na di - na

6 6 6 5 | 6 1 12 1.65  
 a - ja mang-ko - no wong u - tip

**Figure 5. Tembang Macapat Pangkur Slendro Pathet 9**

The students' mastery on Javanese language skills are increasing. Based on the observation, many students who began using Javanese manners when communicating with his teacher and using the language of *Ngoko Alus* when communicating with his friend. Whereas the initial condition of most students still use mixed language and Indonesian language in daily communication, both with teachers and with fellow students. Character education for primary students based on Javanese ethnolinguistics makes students' behavior appear more polite.

#### 4. Conclusion

The implementation of character education for primary students is done through integration in a number of subjects, positive behavior habituation, extracurricular and competition. Each primary school has its own way of instilling the values of the characters of its students. While the character education model for primary school students based on Javanese ethnolinguistic language proved able to form the character of students. This can be seen from the improvement of posttest result, observation result and documentation result of student behavior.

#### 5. Recommendation

Implementation character education should be done from primary school age by involving various components of both family, school and community. It requires high commitment from various parties so that character education can be done optimally.

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# The Influence of Internal Factors and External Factors toward TOEIC Passing Grades In TOEIC Intensive Course for Final Year Students

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**Abstract.** The objective of this study is to prove the effects of variable internal factors and external factors simultaneously to variable TOEIC student graduation rates. The population in this study was 150 respondents. Data analysis was performed using multiple regression using SPSS version 22. The results showed that it was known that F count was 0.902 smaller than F table, which was 3.057. Thus, internal factors and external factors simultaneously did not affect the level of TOEIC graduation.

## 1. Introduction

TOEIC (Test of English for International Communication) is a test to measure English proficiency for those whose daily language is not English. The TOEIC score shows how well a person can communicate in English in the world of education, business, trade and industry. This test does not require knowledge or special terms other than English which is used daily (International Test Center, 2017).

Polbeng (Politeknik Negeri Bengkalis) is located on Bengkalis Island which is the outermost area in Indonesia which is directly adjacent to Malaysia separated by the Straits of Melaka. This makes Polbeng a driver of business incubators and prints graduates who are ready to compete in the industrial world and to face MEA.

Polbeng has 6 (six) departments namely Shipping Engineering, Electrical Engineering, Civil Engineering, Informatics Engineering, Mechanical Engineering and Business Administration. Polbeng also provides prospective graduates to be able to compete in the industrial world, especially in the world of work. In addition, in addition to obtaining a diploma, prospective Polbeng graduates will obtain a SKPI (Certificate of Accompanying Diploma) in recognition or legality of the competence of graduates according to their respective fields of expertise. Therefore, Polbeng requires students to have 400 TOEIC (Test of English for International Communication) scores for exact sciences (Shipping Engineering, Electrical Engineering, Civil Engineering, Informatics Engineering and Mechanical Engineering) and 450 non-exact sciences (Commerce Administration) for sixth semester students (D3) and semester eight (D4). Every student must have the score because it is one of the conditions for completing his studies at the Politeknik Negeri Bengkalis.

Previously, students had taken the IV English course when they were 4 (four) semesters with the material and the discussion was about TOEIC and at the end of the lecture the TOEIC Proficiency Test was held which became the benchmark for their grades whether or not they passed the TOEIC. For students who experience difficulties in TOEIC and have not reached the graduation level, students must take the TOEIC Intensive Course program. The TOEIC Intensive Course program is provided by Polbeng which is an intensive course to increase student TOEIC scores consisting of 12 (twelve) meetings. The material for this intensive TOEIC course includes listening and reading.

This study examines the factors that influence the final semester students' TOEIC graduation level at the TOEIC Intensive Course. This research is important to do, to find out how to increase the TOEIC score of students, namely by looking for factors that have an influence on the level of TOEIC graduation first.

## 2. Literature Review

### 2.1 Previous research

The research of Wibowo (2013) about the correlation between students' motivation and learning styles towards students' English achievement in The State Polytechnic Of Lampung. The objective of this research is to find out whether there are any correlations between students' motivation and learning styles toward their English achievement. Motivation and learning styles have significant correlation toward their English achievement. Continuous learning styles of students with their motivation is a decisive performance improvement study English so that students will be more interested to deepen their knowledge. The material in this study is a questionnaire of learning styles, and motivation to know the students' learning styles and motivation. In addition, as the material to determine the English proficiency of students, this study uses 200 multiple choice questions of TOEIC (Test of English for International Communication). The research method uses a correlation which is one type of research designed to determine the degree of correlation between the dependent variable and the independent variables, both individually using simple linear regression and simultaneous multiple linear regression. Instruments of learning motivation and learning styles of students using a questionnaire with Likert scale, while for the English proficiency test results obtained from the result of test. The study was planned for 6 months April to September 2012 at the State Polytechnic of Lampung. 6 months used for the preparation, determine the sample, giving questionnaires, analyzing data, and seminars. The result of research and data analysis shows that there are closed positive correlation and significant between students' motivation and learning styles toward their English achievement [1].

Aisyiyah (2015) conducted a study on Self Esteem Analysis and Student Perception in English Language on English Language Ability Students of Jember State Polytechnic Superior Program. The study intends to examine whether there is an effect of student self esteem and perception on English both partially and jointly on the English language skills of Jember State Polytechnic students. This research data was collected using a questionnaire for independent variables, and the international TOEIC test for the dependent variable of 50 samples taken randomly. The data obtained were analyzed descriptively and inferentially. From the data analysis, the following results were obtained: (1) there was no effect of self esteem on students' English proficiency, (2) there was a significant influence on students' perceptions of students' English proficiency, (3) there was a significant influence together- the same as students' self-esteem and perceptions of students' English proficiency [2].

Riendrasiwi (2003) conducted a study on A Study on TOEIC Implementation at Vocational High School in Yogyakarta Special Region. This research was conducted to find out the opinions of teachers and students about the implementation of TOEIC in Yogyakarta Special Region. The method used in this study is a survey. The many respondents were Thirty English teachers and 177. The results of this study revealed that the TOEIC score achievement of students was not satisfactory. Only 0.47% -2.22% of the total number of participants whose scores meet the minimum TOEIC score, which is equal to or more than 500. There are five factors that influence the low achievement of students. These factors are system leveling, number of students in each class, school facilities, training in test material and also teachers [3].

Rusyanto (2014) examines the language proficiency of English teachers of Vocational High School in Bali. The proficiency language of the English Vocational School teachers in Bali is a benchmark for English proficiency in the teaching and learning process for students. English language proficiency of vocational teachers is carried out through national examinations [4]. [5] The TOEIC 2012 National Examination held on May 5, 2012 by the British embassy in Jakarta as the Organizing Committee. TOEIC is an International English Language Test for communication to be a measure in teaching English in Vocational High Schools in supporting the national curriculum for teaching English in schools in Indonesia. The TOEIC 2012 was attended by 700 participants including 75 vocational high school English teachers who were representatives of 8 regencies and 1 municipality in Bali. Only 75 teachers from Bali received the 2012 TOEIC results under the National Standards. The results of the 2012 TOEIC were analyzed and reviewed using quantitative and qualitative methods. There are two factors that influence the results of the 2012 TOEIC still below the national standard. These factors are:

psychological factors and non-psychological factors. Toeri used by hyme and George Hillock theory linked by TOEIC results Listening, Reading, Writing and Speaking [6].

### 2.2 *The Factors Affecting Passing Grade/Success*

There are two factors that affect a person's success in learning (Shah, 2009) [7]:

#### *a. Internal Factor*

Internal factors are factors that arise from within the individual itself, while those that can be classified into internal factors are physiological (physical) aspects and psychological aspects (interests, attitudes, intelligence, and motivation).

#### *b. External Factor*

External factors are factors that come from outside students divided into two types, namely social environmental factors and non-social environmental factors.

### 2.3 *Toeic*

Test of English for International Communication (TOEIC) consists of 200 multiple choice questions to determine everyday English skills and includes two language skills, namely listening (listening), and reading (reading). In the Listening Section, there are four types of questions, namely:

Photographs : 10 questions

Question-Response : 30 questions

Short Conversations : 30 questions

Short Talks : 30 questions

In Reading Section, there are three types of questions:

Incomplete Sentences : 40 questions

Text Completion : 12 questions

Reading Comprehension : 48 questions (Lougheed, 2006)

The TOEIC score range is 10-990 which is discribed by ETS in six levels:

1. Level 0/0+ *Novice* (skor 10-250)
2. Level 1 *Elementary* (skor 255-400)
3. Level 1+ *Intermediate* (skor 405-600)
4. Level 2 *Basic Working Proficiency* (skor 605-780)
5. Level 2+ *Advance Working Proficiency* (skor 785-900)
6. Level 3/3+ *General Professional Proficiency* (skor 905-990).

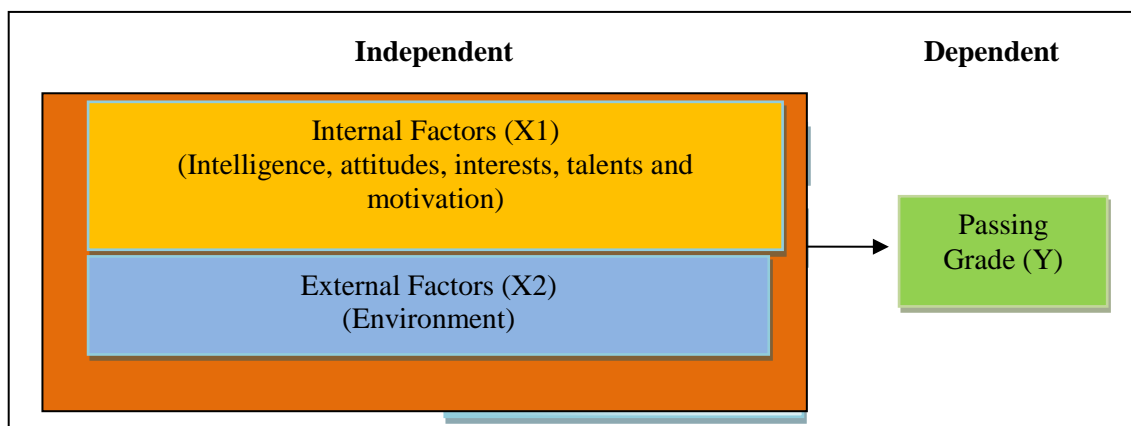
## 3. **Research Method**

### 3.1 *Population*

The population of this study were 6 (six) semester students of Diploma 3 (D3) and 8 (eight) semester programs of Diploma 4 (D4). The population was 150 students, with details of 25 students of Commerce Administration, 25 students of Informatics Engineering, 25 students of Civil Engineering, 25 students of Mechanical Engineering and 25 students of Shipping Engineering.

### 3.2 *Variables*

This study consisted of 2 (two) variables, namely internal factors, external factors and teaching quality factors as independent variables and learning achievement as the dependent variable. To further explain the effect of the independent variables with the dependent variable used in this study, the research model is described as follows:



### 3.3 Data Collection and Analysis Techniques

The data collected for this study are primary data and secondary data. Primary data was obtained by distributing questionnaires. Meanwhile, secondary data is obtained by looking at the TOEIC value of each respondent. Basically, this study aims to describe a particular situation or phenomenon, which can provide supporting information for further research.

Data analysis was carried out, using the help of a SPSS computer program version 22. Data processing used, multiple regression testing tools.

## 4. Research Results and Discussion

### 4.1 Normality Test

In this study, data normality tests were carried out using Kolmogorov-Smirnov. The data normality test results are as follows:

**Table 1. Test the normality of Kolmogorov-Smirnov**

No	Variable	Test Result (Sign)	Result
1	Internal Factors	5,1%	Normal
2	Eksternal Factors	7,8%	Normal
3	TOEIC Graduation	5,7%	Normal

From the table above, it can be seen that the results of normality tests for internal, external, and TOEIC variables are normally distributed because the sign value is greater than 5%. Thus, hypothesis testing can be done using parametric statistics.

### 4.2 The Influence of Internal Factors and External Factors

To test the effect of teaching quality, internal factors and external factors together (simultaneously) on student achievement F test was used. The F test results can be seen in Table 2.

**Table 2. Output of F Test of Multiple Regression**

Model	F Count	F Table	Sign	R Square	Result
Regression	0,902	3,057	0,408	0,012	no effect

From Table 2, it is known that F count is 0.902 smaller than F table which is 3.057 and the sign is  $0.408 > 5\%$  and the value of A R Square is 0.012. Thus the influence of internal factors and external factors together (simultaneously) does not affect the TOEIC graduation. This proves that the campus environment, family environment, community environment, interests, intelligence, attitudes, talents and motivation did not support students fully in the TOEIC graduation.

The results of this study prove that the TOEIC graduation of students at the Politeknik Negeri Bengkalis was not influenced by factors within the students themselves, and also not influenced by environmental



factors. This means that the benefaction of internal and external factors to student TOEIC graduation was only 1.2% and the remaining 98.8% was influenced by other factors not discussed in this study.

## 5. Conclusions and Suggestions

The purpose of this study is to analyze the influence of internal factors and external factors on the TOEIC passing grade of Politeknik Negeri Bengkalis students in the TOEIC Intensive Course. The results of the study prove that internal factors and external factors simultaneously did not affect the student's TOEIC graduation in the TOEIC Intensive Course.

The limitations of this study were data collection using only questionnaires. The next researcher is expected not only to use questionnaires but also supported by interview instruments.

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# Information System Design in Majoring the Interest and Talent of Productive Prospective Teacher of Informatics Education Students Using the AHP Method

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**Abstract.** Determining the location of Teacher Training and Education Faculty student placement in the teaching practice (PPL) based on the competencies of students is very important for the process of developing the skills of the students majoring in Informatics Education at the Faculty of Teacher Training and Education (FKIP) as productive teacher candidates. This is important for the suitability of the competencies of students with the competencies possessed by the school where the students do teaching practice. To facilitate the lecturers who are the committee for the implementation of teaching practice activities in determining the location of the students teaching practice, a decision support system is needed combined with the Analytical Hierarchy Process (AHP) method. This system will process students' value data from the beginning of the semester in each subject to get the competency of the students. The system also processes school data along with the competencies the school has to get the percentage of priority that is used as the basis for the placement of Faculty of Teacher Training and Education students. By placing the students in a school whose competencies are in accordance with the students' competencies, the students are expected to be able to develop skills as an educator and can use the technological skills they have more maximally.

## 1. Introduction

Language is an important means for communication in our daily activities. Through language, we can express our opinion, thoughts, ideas, and feelings. Nowadays, the acquisition of English Language is a must as English is globally used. Considering this need, English as a Second Language (ESL) is taught since kindergarten years in Malaysia. With the increasing need and ceaseless interest in learning English as a second language in Malaysia, it is important to study and understand the factors that can affect the learning process. Among some of the most prominent factors are the students' perceptions and attitudes towards the learning process of English language at school.

Perception is defined as something that is being observed and what is said about it [1, 2]. It varies from person to person, in which every individuals assign different meanings to what they perceive. And the meanings might change for a certain person. One might change one's perspective or simply make things mean something else. Attitude, on the other hand, according to The Concise Oxford Dictionary, refers to a "settled behaviour, as indicating opinion", or a "settled mode of thinking". It is defined as "a hypothetical construct used to explain the direction and persistence of human behaviour." or refers to "our feelings and shapes our behaviours towards learning", or a psychological tendency that may reflect both beliefs and feelings [3, 4]. Thus, behaviour is tied to attitude, as the latter highly affects and manifests itself in the former.

Research works in language learning indicated that learners with positive attitudes were always having more advantage compared to those with negative attitudes [5, 6]. Students' attitude is an integral part of learning; thus, it should become an essential component of second language learning pedagogy. It is important to gain more information regarding students' attitude in order to understand their thoughts and feelings toward learning English in the classroom. It is also paramount to create and raise students'

awareness of practices and use the language in their daily life. A knowledgeable and proficient student will be able to gather, process, publish and communicate information receives in the classroom within a range of contexts across all learning areas. It could prepare the student to use the language and apply the skills in the forms of reading, listening, writing, and speaking. Indeed, knowing one's attitudes and motivation are the best ways to identify the preferences in learning second language.

Therefore, attitude plays an important role in second language learning as it determines to a large extent the learners' behaviours, for example action taken to learn, or efforts exerted, during the learning process. Nevertheless, positive or negative attitude is rooted from an individual perception towards certain matters or objects. This means that the input gains from an individual's perception will influence the attitude of that particular individual toward certain matters or objects, as he or she has made his or her own judgement through the observation. In other words, one's attitude is the result of one's individual perception. Therefore, in learning English as second language, if a student perceived that learning the language is important, he or she will passionately enjoy the learning process. If his or her perception is otherwise, the student may portray a negative attitude in the classroom.

## 2. Research Background

The individual perception and attitude of ESL learners may be influenced by various environmental factors such as the socioeconomic status of family, geographical location of school, and community/societal norms where they lived in. In other words, underprivileged students can be defined as students' population who are being deprived through social or economic conditions of a civilized society. Individuals who are underprivileged are at disadvantage in many aspects, especially in term of education. As a matter of fact, an underprivileged individual might not even afford to go to school. It means that this individual does not have access to services and opportunities which the general population enjoys. In a formal learning process, underprivileged students' perception and attitude can be greatly influenced, and may hindrance their learning. To illustrate, when a student comes from low-income family, he or she will not has the advantage to learn in a comfortable and supportive environment; thus, their motivation may drop and end up quitting school. Students who were considered underprivileged (coming from family with low SES, schooling in remote areas, or living in an unsupportive community) may have different perception and attitude in learning English in comparison to their peers with opposite backgrounds [7].

However, there are limited numbers of study on underprivileged students' perception and attitude in learning English. There are many studies on students' perception and attitude but most scholars usually focusing on secondary students with lower grade, or among university students [8]. Studies regarding university students usually found that most students have positive attitude towards English while for secondary students they mostly have moderate level of motivation and attitude towards English. A particular study investigated motivations and attitude for learning English among year six students in Malaysian primary rural school had found out that the students appeared to have a positive attitude towards learning English language, whereby the results demonstrated that the participants had the interest and desire to excel in their English classes [9]. Another study indicated that students with negative attitudes towards learning English literature are Malays, males, does not speak another language at home, does not have siblings or parents who speak English, comes from a lower income family of less than RM500 per month, low marks for final English Form Four examination, and comes from an arts class in a rural school [10]. In short, students that come from a lower income family and rural schools have negative attitudes towards studying literature in English.

As research works on perception and attitude of local underprivileged students toward learning English as a Second Language (ESL) are far and rare in between, this research is designed as a preliminary case study in order to understand the students' views to make the process of learning English is more effective despite of their deprived conditions. It is conducted with main objective to identify local underprivileged students' perception toward English which affected their attitude in learning the language. In other words, the researchers want to find out the students' struggles, interests, and desires in learning English as a Second Language (ESL). Specifically, the objectives of this study were to:

- a. determine underprivileged students' perception towards learning ESL
- b. determine underprivileged students' attitude towards learning ESL
- c. examine underprivileged students' views to improve teaching-learning methods to match with the students' needs

### 3. Methodology

This is a quantitative study using the cross-sectional survey questionnaire design. As an initial case study, a minimum total of 30 [11] Form Three students were recruited from a school in the area of Selangor, Malaysia as respondents. They have been identified as underprivileged students due to socioeconomic status of the families.

The questionnaire was adapted from the original survey developed by a Saudi Arabian researcher [12]. It consisted of 22 items, answered using a 5-point Likert Scale. The collected data was descriptively analysed to answer the research questions as follows:

- a. What are the students' overall views in learning ESL?
- b. What is the level of difficulty in learning ESL? If it is, which part of learning the language is difficult?
- c. What do the students do to improve their learning of ESL?

### 4. Results

As shown in Table 1, most of the participants agreed that learning English is fun (66.66%); only a small percentage of the participants disagreed (20%), while the percentage of those who strongly disagreed, or said that they did not know was 13.33%. Similarly, the percentage of the participants who agreed that they like to listen to people speaking English (73.33%) was much larger than the percentage of those who disagreed or said they did not know which both have the same percentage of 13.33%. Moreover, no participants strongly disagreed. Likewise, a large percentage (70%) of the participants agreed that they really wanted to learn English, and percentage of 16.66% said that they did not know while 13.33% of the students disagreed. Furthermore, as in the responses to the previous statements, strong disagreement remained 0%. The statement "I dislike English" elicited 20% of agreement compared to 56.66% of disagreement, while 23.33% of the participants said that they did not know. The statement "I only learn English because it is compulsory in school" elicited more disagreement (66.66%) than agreement (16.66%). Interestingly, the total number of those who agreed and those who strongly agreed matched the figure of those who said they that did not know (16.66%). As for the image of those who spoke English, a large percentage of 73.33% agreed that when someone spoke English, it showed that he/she is educated, with 6.66% strongly agreed while 6.66% disagreed. The 13.33% difference was equal to the percentage of those who stated that they did not know. However, most of the participants strongly agreed, or agreed, that speaking English well could create a good impression with the total high percentage of 93.33%. The percentage of those who did not know was only 13.33%. Surprisingly none of them disagree about the statement (0%). Same goes for strong disagreement. Moreover, all participants either strongly agreed, or agreed, that learning English was important for their future, with a higher percentage of those who agreed (73.33%) and strongly agreed with 13.33%. Similar to the responses of the previous statement, virtually all the participants agreed that learning English could help them find better job opportunities, with a higher percentage of those who agreed (73.33%) and a total percentage of 80% representing general agreement. Only 13.33% said that they did not know, and a small number of percentage 6.66% said they disagree. Also, a total high percentage of 80% agreed that learning English was essential to further the study in a higher level, with 13.33% of them strongly agreed. On the other hand, only 6.66% disagreed, and 13.33% stated they did not know. There was no strong disagreement (0%). Furthermore, there was an overall agreement among participants that they needed English when they travelled abroad, and the percentage of those who strongly agreed (76.66%) exceeded that of those who agreed (23.33%). However, it seems that students have different opinion on statement "I need English when I search the internet" with more of them were on disagreement side (43.33%) although the difference was not big with the percentage of those who agreed was 36.66%. The rest said that they did not know (20%

**Table 1: Students' overall views on learning ESL**

No.	Statement	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
1.	Learning and speaking English is fun.	5 16.66	15 50	4 13.33	6 20	0 0
2.	I like to listen to people speaking English.	2 6.66	20 66.66	4 14.33	4 13.33	0 0
3.	I really want to learn English.	1 3.33	20 66.66	4 13.33	4 13.33	0 0
4.	I dislike English.	0 0	6 20	4 13.33	20 66.66	0 0
5.	I only learn English because it is compulsory in school	0 0	5 16.66	5 16.66	20 66.66	0 0
6.	When someone speaks English, it shows that he/she is educated.	2 6.66	22 73.33	4 13.33	2 6.66	0 0
7.	Speaking English well can create a good impression.	3 10	25 83.33	2 6.66	0 0	0 0
8.	Learning English is important for my future.	4 13.33	22 73.33	4 13.33	2 6.66	0 0
9.	Learning English can help me find better job opportunities.	4 13.33	22 73.33	4 13.33	2 6.66	0 0
10.	Learning English is essential to further my study	4 13.33	22 73.33	4 13.33	2 6.66	0 0
11.	I need English when I travel abroad.	23 76.66	7 23.33	0 0	0 0	0 0
12.	I need English when I search in the internet.	1 3.33	10 33.33	6 20	10 33.33	0 0

Table 2 shows that 66.66% of the participants agreed that learning English was difficult. A slightly lower percentage disagreed (20%), while 16.66% said that they did not know. Similarly, with regards to grammar and structure, 80% of the participants strongly agreed or agreed that both aspects were difficult for them. The total percentage which represented disagreement in general was 16.66 and only a small number of 3.33% said they did not know. A large proportion (83.33%) of the participants strongly agreed or agreed that lack of vocabulary made understanding and communicating in English difficult. Noticeably, none of the participants have disagreement towards this statement although there were those who did not know (16.66%).

**Table 2: Level of difficulty in learning ESL and which part of it is difficult?**

No.	Statement	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
14.	Learning English is difficult.	5 16.66	15 50	4 13.33	6 20	0 0
16.	I find English grammar and structure difficult	4 13.33	20 66.66	1 3.33	5 16.66	0 0

17. Lack of vocabulary makes understanding and communicating in English difficult.	5	20	5	0	0
	16.66	66.66	16.66	0	0

As for skills, it can be seen in Table 3 that all participants thought that speaking was difficult (100%); writing came second (86.66%); listening came third (36.66%); while reading came last (10%).

**Table 3: What do you consider as a difficult skill in English?**

Writing	Reading	Listening	Speaking
26	3	11	30
86.66%	10%	36.66%	100%

As can be seen in Table 4, 50% of the participants agreed that they could improve their English. Interestingly enough, a slightly smaller proportion said that they did not know (43.33%). Only 6.66% disagreed with the statement. It was noticeable that the students had the same percentage of 33.33% for overall agreement, disagreement, and didn't know for statement "I don't have time to improve my English".

**Table 4: Do you believe you can improve their English?**

No.	Statement	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
13.	I think I can improve my English	0	15	13	2	0
		0	50	43.33	6.66	0
15.	I don't have time to improve my English.	2	8	10	10	0
		6.66	26.66	33.33	33.33	0

As shown in Tables 5, when the participants were asked to state their own strategies to improve their English proficiency, surprisingly most of them chose none with the percentage of 66.66%. The second popular choice tied between reading simplified English books and look up new vocabulary and check pronunciation (26.66%) while the third was review new grammar points after class (20%). The next popular choice was practicing the correct pronunciation and new structures with friends and/or family (13.33%). While there were 11 options provided only 5 were chosen by participants and the rest got 0%. Some of the higher numbers were not expected such as 20% of students do nothing to improve their English although most of them claimed to like English. Moreover, it seems that students really have different opinion although their situation is the same.

**Table 5: What do you do to improve their English?**

1. I read simplified English books.	8	26.66%
2. I watch English programs.	0	0%
3. I keep a notebook with all new vocabulary and practice writing them in sentences.	0	0%
4. I review the new grammar points after class	6	20%
5. I practice the correct pronunciation and new structures with my friends and/or family.	4	13.33%
6. I read articles on the internet.	0	0%
7. I listen to native speakers reading and/or speaking on the internet.	0	0%
8. I look up new vocabulary and check pronunciation.	8	26.66%
9. I take extra English courses.	0	0%
10. None of the above.	20	66.66%
11. Other, specify.	0	0%

## Discussions and Conclusion

The overall responses indicate that majority of underprivileged students in this study had positive attitude towards learning English. This reflected in the students' perception that English is important for their future, in which it is a necessity for furthering studies and get better job opportunities. In other words, the students had good impression about learning English and they were aware of the benefits to learn English. Hence, the impression was parallel with the students' attitude towards learning English, which means that the positive attitude was influenced by the positive perception that they possessed.

Furthermore, majority of the students believed that they could improve their English despite of various limitations that they faced as underprivileged students. This reflects the students' confidence in their ability to improve their English language proficiency. The remaining minority, who were in doubt about their ability to get better in learning English as a Second Language (ESL), might be influenced by the factors such as limited resources, opportunities, so on and so forth [13]. Even though most of the students have positive feelings towards English, surprisingly they didn't put much effort to improve their English proficiency. Therefore, teachers need to assist the students to improve in the related areas of the language by using creative teaching methods that encourages and allows the practices of the language in the classroom [14]. Sooner or later, it will leave a good impact to the students and motivate them to be a better learner of the language.

As for the way to improve the ESL learning process, most of the respondents believed that the need of getting sufficient practice of the language is the essential strategy. They were convinced that their English would improve if they could practice English in their everyday life with others, especially those who spoke English well, and if they were trained in understanding people who spoke English. This need could be fulfilled with the setting up of an English speaking environment/community [15]. By having this set-up, considerable numbers of activities such as English Speaking Day and competitions could be held to help the students practise English in their daily lives, which in turn would improve their mastery of English as a Second Language (ESL). This can further be enhanced if the set-up is equipped with latest communication technology like multimedia and internet, so that the students could practice communicating online with English native speakers around the world [16].

In a nutshell, findings of this initial case study provide some basic information about Malaysian underprivileged students' perception and attitude towards learning English as a Second Language (ESL). This preliminary data could help stakeholders of local education system like policy makers, teachers, and parents to think of necessary actions to take in order to help these students learn the language effectively. However, this baseline data need to be enhanced with further research works, so that the phenomenon could be understood in depth and more thorough.

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# The Factors Affecting TOEFL Graduation Rates in the Intensive TOEFL Training Program, for Students of the English Tadris Study Program, STAIN Bengkalis

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**Abstract.** The purpose of this study is to examine the factors that influence the level of TOEFL graduation of English Tadris students in the Intensive TOEFL Training Program. The population in this study were 113 respondents. The results of this study are Method variables (X1), Material (X2), Media (X3) and Instructor (X4) jointly influence the student's TOEFL graduation rate of 89.2% while the rest (10.8%) are influenced by other factors .

## 1. Introduction

1. TOEFL (Test of English as a Foreign Language) has been used by government scholarship selection agencies, universities, and agencies such as Fullbright (The Agency for International Development), the Latin American Scholarship Program, and others as a benchmark for English language proficiency . Bengkalis State Islamic High School (STAIN) is located on Bengkalis Island which is the outermost area in Indonesia which is directly adjacent to Malaysia separated by the Straits of Melaka. This makes Bengkalis STAIN must be ready to compete in the international world.
2. For most people, it's not easy to get a high TOEFL score. Intensive learning and training is required to get a high TOEFL score. English lessons obtained in lectures are far from enough to get the expected TOEFL exam scores. Likewise with those who want to study abroad.
3. Students of the English Tadris Study Program learn Introduction to listening, Intensive listening, Listening for TOEFL, grammar, speaking, writing and reading in different semesters. The Intensive TOEFL Training Program is provided by the English Tadris Study Program which is an intensive program to increase student TOEFL scores consisting of 16 (sixteen) meetings. The material for this intensive TOEFL course includes listening, structure and written expression, and reading comprehension.
4. This study aims to examine the factors that influence the level of TADris English TOEFL graduation in the Intensive TOEFL Training Program. This research is important to do, to find out how to increase the value of the students' TOEFL, namely by looking for factors that influence the level of ETOFL graduates first.
5. Based on the background of the above problems, this study will be studied further with the title: "Factors Affecting the Level of TOEFL Graduation in the Intensive TOEFL Training Program for Students of the English Tadris Study Program STAIN Bengkalis

### 1.1 Literature Review

#### 1.1.1 Previous research

The research of Sugeha (2015) about Students' Motivation on Learning English at TOEFL Program of ELFAST English Course in Pare. The objective of this research is to find out whether there are any correlations between motivation used by the students at TOEFL Program of ELFAST English Course in Pare. In her study, the writer used descriptive quantitative approach. The instrument used to investigate motivation is AMTB questionnaire designed by Gardner (1985). The data sources of this study were 24 students of TOEFL Program which was divided into three classes, A, B, and C. In collecting the data the writer did the process of distributing the questionnaire and putting them into a

table. The result of research and data analysis showed that the types of motivation used by the students at TOEFL Program of ELFAST English Course in Pare was instrumental motivation and integrative motivation and the primary types of motivation among the students was instrumental motivation. Related to the relationship between motivation and the students' TOEFL scores, the positive significant correlation is revealed between motivation and students' English proficiency measured by TOEFL final scores.

The research of Riskiana (2010) about Optimizing Listening Skills to Improve the TOEFL score of STAIN Pekalongan Students. . This research aims at: (1) finding out whether optimizing listening skills can improve the students' TOEFL scores on listening; and (2) describing the class situation during the teaching of TOEFL listening by optimizing listening skills. This action research is conducted in two cycles each of which is divided into planning, acting, observing, and reflecting. There are two kinds of data. The qualitative data taken from observation, interview, and questionnaire are analyzed by using Constant Comparative Method. The quantitative data taken from the pre-test in the pre-research, post-test in cycle 1, and post-test in cycle 2 are analyzed by using descriptive statistics. The subjects of the research are the STAIN Pekalongan students taking English 3 class, the TOEFL Preparation Class, in the Academic Year 2014/2015. The result of the research shows that: (1) teaching toefl listening section by optimizing listening skills is able to overcome the students' problems in the three micro-skills of listening and consequently improve the students' TOEFL scores on listening. Their average scores improve from 101 in the pre-test to 118 in the post-test of cycle 1 and 129 in the post-test of cycle 2; (2) The class situation is attractive and the students are actively involved in the various activities done during the teaching and learning process. In line with the success of optimizing listening skills in teaching TOEFL listening, it is suggested that teachers should examine their students' listening problems so as to be able to teach them what they need in listening to English.

Muliyani, et al. (2015) conducted research on Motivation, Commitment and Culture of the Learning Environment towards Learning Achievement Participants of the TOEFL Preparation Course at the Hasanuddin University Language Center. This study aims to determine the effect of motivation, commitment, and culture of the learning environment on learning achievement (increase in English Language score / TOEFL score) of English Language Course participants at the Hasanuddin University Language Center. This research was conducted at the Hasanuddin University Language Center. Population involved 150 participants of the English Language Course (TOEFL Preparation) consisting of three research population groups namely TOEFL Preparation from the general public, TOEFL Preparation from the Unhas postgraduate program and TOEFL Preparation from the Unhas S1 students

The number of sample in this study was 100 people from TOEFL Preparation course participants, the number of samples was obtained from the results of Slovin formula. The sampling technique used was random sampling. The source of data collection was the participants of the English Language course at the Hasanuddin University Language Center. Data collection techniques consist of subject analysis, observation, questionnaire / questionnaire and literature study. The analysis technique used is multiple regression analysis. The results showed that all hypotheses were accepted. Based on the test that the motivation, commitment and culture of the learning environment had a positive and significant effect on learning achievement both from partial and simultaneous testing. R-squared values could explain 55.4% of learning achievement, while the rest explained by other variables outside the model. Adjusted R-Squared values on learning achievement models of 54.0% variants of the dependent variable can be explained by independent variables.

#### *1.1.2. Factors that influence the level of TOEFL graduation*

The success of teaching and learning is a matter that is highly expected by the teacher in carrying out their duties, but the teaching factor is not the only factor that influences the success of learning. According to Hartanto and Inayati (2016: 133) the factors that influence the level of TOEFL graduation or the success of teaching and learning are:

### 3. Method

The method means a systemic way of working to facilitate the implementation of an activity in order to achieve the specified goals (Depdikbud, 1990). The method has a very large role in an educational process. If the education process does not use the right method, it will be very difficult to be able to expect maximum results.

There are a number of methods that can be used by educators. Among them are: a) Informative methods namely methods for conveying information, the form can be in the form of teaching sorogan, wetonan, lectures, panel discussions, b) Participatory methods are used to involve in processing material. The form of questions and answers, group discussions, brainstorming, and c) experiential methods is a method that allows participants to get involved in learning experiences. The form can be a method of training sensitivity, demonstration, practice

#### 3.1. Media

Media can be interpreted as an "intermediary" or "introduction". Association for Education and Communication Technology (AECT) provides understanding of the media as all forms used for a process of information distribution. While the Education Association (NEA) defines as objects that can be manipulated, seen, heard, read or discussed along with instruments that are used properly in teaching and learning activities (Mulyasa, 2003).

Media in the perspective of education is a very strategic instrument in determining the success of the teaching and learning process. Because its existence can directly give students its own dynamics. With its limitations, humans are sometimes unable to capture and respond to things that are abstract or that have not been recorded in their memories. To bridge the process of internalization of teaching and learning as such, it is necessary to have educational media to clarify and facilitate students in capturing the educational messages delivered. Therefore, the more students are presented with a variety of media and infrastructure that supports it, the greater the likelihood that educational values can be absorbed and digested.

#### 3.2. Learning and Teaching Materials

According to Panen and Purwanto (2001) teaching materials are materials or subject matter that are arranged systematically, which is used by the teacher / teacher and students in the learning process. So teaching materials are all forms of materials used to help the implementation of teaching and learning activities. The material in question can be in the form of written material or unwritten material.

Teaching materials if grouped by type are 4 types of printed material (material printed) such as handouts, modules, books, worksheets, brochures, photos / drawings and models. Hearing teaching materials such as cassettes, radio, LPs and compact disk audio. Material teaches views such as video compact disks and films. Interactive teaching materials such as interactive compact disc.

#### 3.3. Instructor

In the Republic of Indonesia Law number 20 of 2003 article 1 states that Educators are qualified teaching staff as teachers, lecturers, counselors, tutors, widyaiswara, tutors, instructors, facilitators, and other designations that are appropriate to their specificity, and participate in organizing education.

The function of educators according to Hasbullah (2003) is as a guide, influence, to foster student activities and at the same time as a responsibility for the implementation of education.

The good conditions for educators are:

##### a. Teaching Skills

An educator must have the skills to educate or teach, give instructions, and transfer knowledge to students. He must be able to give encouragement, foster and develop so that students.

*b. Social skills*

An educator must have skills in the social field in order to ensure the trust and loyalty of students, which is helpful, objective if students advance and can respect the opinions of others.

*c. Technical Competent*

An educator must have technical skills, theoretical skills, and agility in taking decisions.

*3.4. Toefl*

In general, TOEFL is more oriented to American English, and is different from the type of IELTS that is oriented towards British English. In general, the TOEFL does not have a dual interview test section. The TOEFL consists of 3 parts, namely the listening comprehension section (50 items), structure and written expression (40 items), and comprehension (50 items). The Test of English as a Foreign Language (TOEFL) consists of 140 subjects in multiple choices to know English.

*1). Listening Comprehension*

Listening sessions consist of two conversations (short and long conversation). In the conversation there will be two speakers, namely a student and a professor or a campus staff. Meanwhile, in lectures or discussions there will be academic discussions. In this test, participants will only be given one-time conversation and discussion material. Each conversation will be followed by 5 questions and each discussion will be followed by 6 questions. These questions are intended to measure participants' ability to understand the main ideas, important information details, implications, interconnected ideas, unity of information, the purpose of the speaker, and the attitude of the speaker.

*2. Structure dan Written Expression*

Writing sessions measure the ability of test participants in writing that consists of two exercises. The first exercise is interrelated practice and the second is independent training. In interrelated exercises, participants read an academic themed reading and then listen to a discussion that has the same theme. Participants will write a conclusion about the important points of what they hear and explain their relationship to what they read.

*3. Reading Comprehension*

Reading (reading) sessions consist of 3 to 5 readings, each containing 700 words and followed by several questions related to the reading. The theme of these readings is academic, that is about the things commonly found in college books. In addition, these readings also contain several rhetorical functions, such as causation, comparisons, and arguments (opinions). In this session, test participants will be asked about the main ideas, details of readings, conclusions, important information, information (insert statements), vocabulary, rhetorical goals, the overall idea, and the latest is to fill in the table or complete the conclusion.

**3. Method**

*3.1. Population*

The population of this study were semester 1 (one), III (three), V (five), and VII (seven) English Tadris Study Programs. The population is 113 students, with details of 27 first semester students, 19 third semester students, 26 V semester students, 41 VII semester students.

*3.2 Variables*

The variables analyzed in this study are divided into dependent and independent variables.

a. Dependent variable (Y) is a dependent variable whose existence is influenced by other variables in the model. In this study the dependent variable is the TOEFL Value of Intensive Course Students

b. Independent Variables (X) are independent variables which will influence the dependent variable consisting of: Method (X1), Material (X2), Media (X3) and Instructor (X4).

### *3.3 Data Collection and Analysis Techniques*

The data collected for this study are primary data and secondary data. Primary data was obtained by distributing questionnaires. Meanwhile, secondary data is obtained by looking at the TOEFL value of each respondent. Basically, this study aims to describe a particular situation or phenomenon, which can provide supporting information for further research.

Data analysis was carried out, using the help of a SPSS computer program version 22. Data processing used, multiple regression testing tools.

## **4. Research Results and Discussion**

Achievement of TOEFL student test scores at the TOEFL Training Program incentive is not satisfactory because most still have a value in the 350-450 range. Respondents felt that the method and media in the TOEFL program that had been followed did not support good TOEFL achievement. Therefore, it is necessary to know what factors influence the level of student TOEFL graduation. The results of the analysis of variance analysis is that the sig value obtained is equal to 0,000. Because the sig value obtained is smaller than the critical point (0.005), the TOEFL score of students at the incentive TOEFL Training Program is influenced by the method variables (X1), material (X2), media (X3) and TOEFL instructors (X4) together.

In testing the value of the Determination Coefficient, the value to be considered is the value of the Determination Coefficient (R<sup>2</sup>) of 0.892. This means that the Method variables (X1), Material (X2), Media (X3) and Instructor (X4) jointly influence the student's TOEFL graduation rate of 89.2% while the rest (10.8%) are influenced by other factors . The next test result is the regression coefficient value.

### *4.1. Variable X1 (TOEFL Method)*

The significance value of the X1 variable is 0.019. Because the value is smaller than 0.05, it can be concluded that the variable X1 individually has a significant effect on the level of TOEFL graduation. The regression coefficient value of the X1 variable is 0.019. This means that if the quality and quantity of the TOEFL learning method (X1) is improved it will have an impact on the level of TOEFL graduation. Conversely, if the quality and quantity of the TOEFL learning method (X1) decreases it will result in a decrease in the TOEFL value. The conclusion is the learning method variable (X1) is one of the variables that significantly affect the level of TOEFL graduation.

### *4.2. Variable X2 (TOEFL material)*

The significance value of variable X2 (TOEFL material) is 0.015. The value is smaller than 0.05, it can be concluded that the variable X2 individually has a significant effect on the level of TOEFL graduation. The regression coefficient value of the variable X2 is 0.015. The conclusion is the TOEFL material variable (X2) is one of the variables that significantly affect the level of TOEFL graduation.

### *4.3. Variable X3 (TOEFL learning media)*

The significance value of the X3 variable (TOEFL learning media) is 0.559. Because the value is greater than 0.05, it can be concluded that X3 variables individually do not significantly affect the level of TOEFL graduation. The conclusion is that the learning media variable (X3) is one of the variables that has no significant effect on the level of TOEFL graduation.

### *4.4. X4 Variable (TOEFL Instructor)*

The significance value of the variable X4 (TOEFL Instructor) is 0.044. Because the value is smaller than 0.05, it can be concluded that the X4 variable individually has a significant effect on the level of TOEFL graduation. The conclusion is the TOEFL instructor variable (X4) is one of the variables that significantly influence the level of TOEFL graduation.

## **5. Conclusions and Suggestions**

The purpose of this study is to examine the factors that influence the level of TOEFL graduation of English Tadris students in the Intensive TOEFL Training Program. The result is that the Method variables (X1), Material (X2), Media (X3) and Instructor (X4) jointly influence the student's TOEFL passing rate of 89.2% while the rest (10.8%) are influenced by other factors.

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**SCIENCE &  
TECHNOLOGY**

# System Detection and Prevention of Malware Wannacry Distribution Using Short Message Service

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**Abstract.** Internet network is not something new today. In almost every place like corporate, education, offices and even public places, have also found the Internet to facilitate the flow of information. In the daily life of the Internet network becomes one of the important needs. With the Internet network, it will be easier for us in terms of sharing of data and information. Computer network security system has become a major part of an important and need to be considered in an agency, as reported in some media either inside or outside the country, there has been a phenomenon WannaCry malware attacks in several countries, including Indonesia. This WannaCry malware attacks spread and massive character and attacking computer connected to the internet, to provide protection or protection on an Internet network to avoid the various external threats in order to avoid WannaCry malware attacks by using application Spreading Malware Detection and Prevention Based WannaCry Short Message Service. From the test results have shown that the system is capable of detecting interference or intrusion into the network connected to the network and the Internet through a router to the rejection of the action and then send alerts in the form of a short message via Short Message Service to the network administrator phone.

## 1. Introduction

Almost no aspects of human life can separated from technology. Especially computer technology as it can see from the widespread use of computers. Advances in communications technology have an influence on the development of data processing, data from one place sent to another place by means of telecommunications, computer networking is not something new today, almost every company and there is a government agency computer networks to facilitate the flow of information. Internet are gaining popularity today is a giant computer network which is a computer network and can interact, so that within a few years the number of network users who are members of the Internet doubled.

Polytechnic of Bengkalis is one of the agencies whose activities supported by a network of internet in daily activities ranging from data processing, information systems, Mail Server, Web Server and several other functions. UPT-Computer as network administrators who manage the Internet network on the campus of Polytechnic of Bengkalis build network security systems by implementing Firewall and Proxy Server. Security with Firewall and Proxy Server system is sometimes still a gap for hackers, viruses, and so on to gain entrance into the existing network system using a variety of tools to bypass the firewall and proxy servers are used.

As reported in several media either inside or outside the country, there has been a phenomenon WannaCry malware attacks in several countries, including Indonesia. Malware attacks from WannaCry it is spread and massive and infect a computer connected to the internet. Therefore, to improve network security systems on campus Polteknik State Bengkalis one solution that used to help administrator in monitoring the condition of the network, analyzing packets and prevent anything that can harm the tissue is to use an application Spreading Malware Detection and Prevention Based Wannacry.

This system will detect interference or intrusion into the network connected to the Internet network, a warning mechanism is by way of sending messages to mobile phones in the form of SMS administrator.



The technology used to send Short Message Service is to utilize the Short Message Service Gateway. With the alert via Short Message Service, a security system would be better.

## 2. Method

The study had stage-by-stage settlement is structured in a research procedure. Research procedure starts with identifying the problem, at this stage, will be presented the stages that done in the system design. The stages on design of this system are the preparation, planning, design, implementation, operation, and optimization as shown in Figure 1.

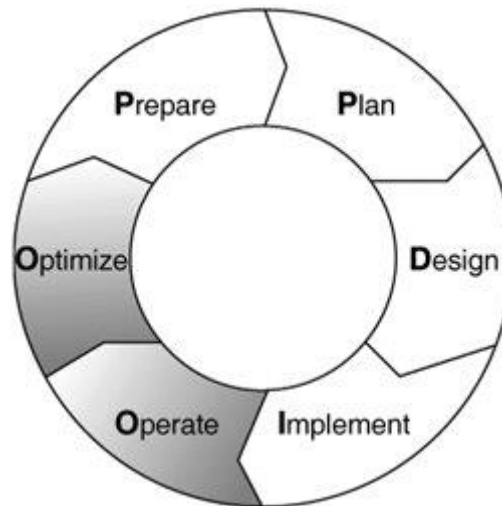


Figure 1 Stages in system design.

### 2.1. Preparation phase

At this stage, preparations will be made to establish the needs or data that will be used to design the proposed system. As for the preparations to be done is to collect research data such as ports that are frequently accessed by malware and Determining the software that will be used to design the system.

### 2.2. Planning phase

Phase Plan (planning) to identify the network requirements based on destination, amenities, and user needs. This phase describes the characteristics of a network, which aims to assess the network, perform gap analysis on the best design of an architecture, by looking at the behavior of the operational environment. A project plan was developed to manage tasks (tasks), the parties responsible, stepping stones (milestones), and all the resources to undertake the design and implementation. Project planning should be in line with the scope (limitations), cost and resource parameters that are tailored to business needs. The project plan is followed (and renewed) during the phases in the cycle.

### 2.3. stage Design

Network design developed based on technical requirements, and business acquired from previous conditions. Network design specifications is a design that is comprehensive and detailed, which meet the technical and business requirements today. The network should provide availability, reliability, security, scalability and performance. Results designs include network diagrams and a list of equipment. The project plan must be constantly updated, with more detailed information to be implemented. Once the design phase is completed, the implementation phase begins

### 2.4. Implementation of phase

In this phase, new appliances do installation and configuration, appropriate design specifications. These new devices will replace or add to the existing infrastructure. Project planning must also be followed during this phase, if there is a change should be addressed at the meeting (meeting), with the necessary

approvals to proceed. Each step in the implementation, should include a description, detailed guidelines for the implementation, the estimated time for implementation, evaluation (rollback) measures if there is a failure, and other information as additional references. As the changes have been implemented, the stage is also a testing step, before moving to the operational phase (phase Operate)

### 2.5. Operational phase

Operational phase is to maintain daily activities resilience network. Operations include management and monitoring of network components together components, maintenance routing, manage the activities of the upgrade, manage performance, identify and correct network errors. This stage is the ultimate test for the design stage. During operation, network management should monitor the stability and performance of the network, error detection, correction configuration and performance monitoring activities, which provides preliminary data for the next phase, namely the phase of optimization (optimize phase).

### 2.6. Phase Optimization

The optimization phase, involving a proactive awareness by identifying network management and resolve problems before they affect network issues. Optimization phase, allowing to modify the design of the network, if too many network problems that arise, and also to fix the performance problems, or to solve the problems in the application (software). Requirements-requirement for the modified network design directs the development of the network, back to the beginning of the life cycle in phase models PPDIOO

## 3. Research Result

Figure 1 shows that there is a system designed to monitor the network traffic flow that occurs in the router. The flow of traffic in the flow monitoring is at the port. The system will detect ports passing through the router. Therefore, there are multiple ports indicated as the commonly used ports on the spread of malware such as Wannacry. The ports indicated as ports used, as a stream of malware is port 137, 138, 139, 445 and 3389. Therefore, when there is a flow from the ports, then the system will take action. The action taken is to close the port and simultaneously sends flow information contains no malware. The information sent via Short Message Service Gateway. Users will receive information in the form of Short Message Service.

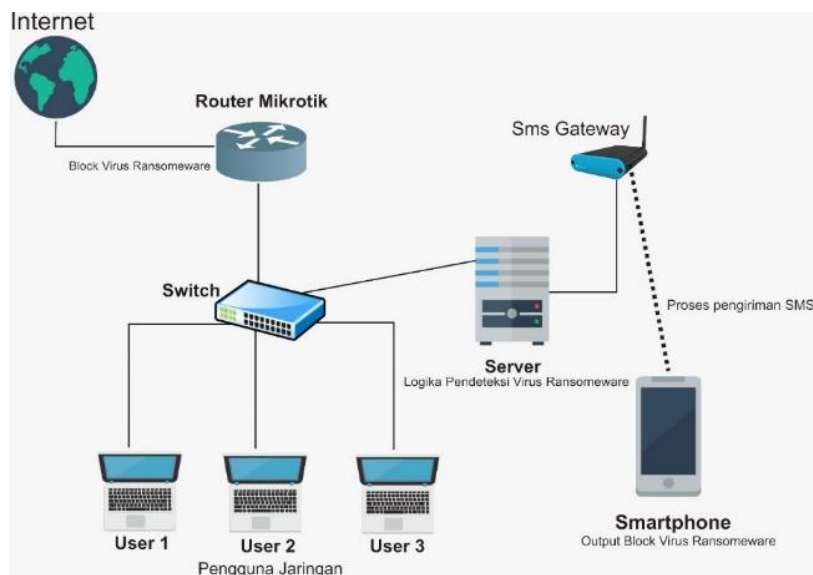


Figure 1 Results Design System.

The process flow looks like the following picture

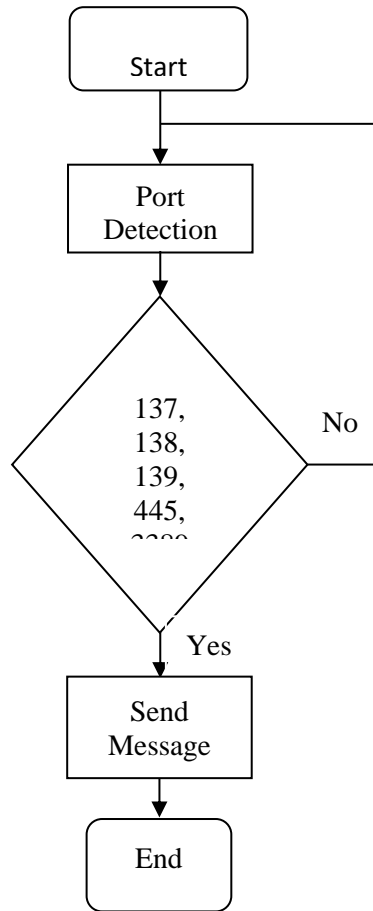


Figure 2 Flowchart of system design.

Figure 2 shows the flow of the proposed process. In the diagram shows some of the processes used starting from the detection port. Port detection used to detect whether there is a network that passes through the ports in the selection. If there is a network that passes through the ports selected then the system will send information in the form of a Short Message Service via Short Message Service Gateway.

Figure 3 shows the ports that often used by malware like Wannacry. So these ports used to detect malware.

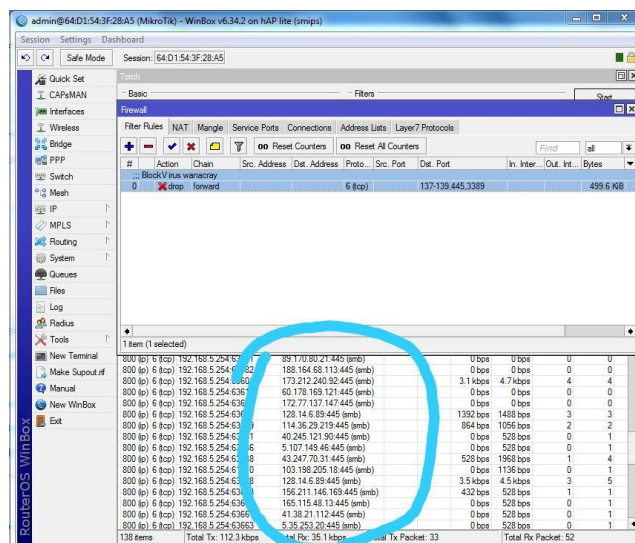


Figure 3 Block SMB.

Figure 4 shows the contents of Short Message malware detection results. When there is malware that infiltrate into the router, the router will block these sites then the router will send an SMS containing that no malware infiltrated the network through the Short Message Service gateway.

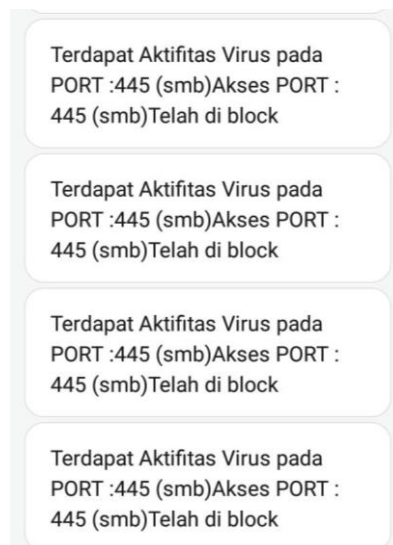


Figure 4 Short Message malware detection results

#### 4. Conclusion

Of the system that produced show, which the system is able to detect malware infiltrating through the router, as for ports that are often passed malware that is 137, 138, 139, 445 and 3389. Ports used to detect malware that goes through the network. The system is designed to make web-based applications built using web programming languages like html, php, css, web applications are built are placed on a server or hosting. The application used to monitor a proxy router. So that when there are access ports (137, 138, 139, 445 and 3389) on the router, the system will take action that is sending information to the administrator or other parties via Short Message. Short Message will be sent by using Short Message Service Gateway.

There is a downside of the proposed system is that all the networks will access or pass through ports which have been determined (137, 138, 139, 445 and 3389) will be considered as malware activity. So this system cannot distinguish between that which passes through the ports malware is malware or not.

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## The Regional Development Based on Leading Sectors in Kuantan Singingi Regency, Riau Province

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**Abstract.** Decentralization policy conducted by the government through regional autonomy is an effort to restructure the nation life better. But in fact there are still many areas that have not been able to utilize of the policy as well as possible. Kuantan Singingi Regency is one of regency in Riau Province that experienced a decline in income, followed by the reduction of prices of some commodities in the featured sector. By seeing this case, need for a strategy in facing that condition. The purpose of this study is to formulate a strategy for regional development in order to improve public welfare of Kuantan Singingi Regency. The study approach are identify the leading sectors, identify the typology of leading sector, identify competitive ability of leading sectors and formulate a regional development strategy based on leading sector in Kuantan Singingi Regency. The analysis method used location questions, dynamic location questions, shift share and typology sectors, and SWOT Analysis to formulate the strategy. The results of the research is identified that there are 9 leading sectors of the 17 sectors, namely (1) Agriculture Sector, Forestry and Fisheries, (2) Manufacturing Industry, (3) Water Supplying Sector, Waste Management, Waste and Recycling, (4) Construction Sector, (5) Real Estate Sector, (6) Administration Sector, Defense and Social Security Mandatory, (7) Education Service Sector, (8) Health Service and Social Work Sectors, (9) Other Services Sector. Based on the typology of the 9 sectors, 8 sectors are prospective sectors and 1 sector is not prospective (construction sector). Furthermore, competitiveness ability of the leading sectors are classified in the good competitiveness, because of the value growth of the nations' territory (PPW) > 0. Then the result of the formulation of the strategy based on components of the core region the resulting strategy is to optimize local resources exist to improve the quality of labors, transport and communication components, products of the leading sector, and utilize government's abilities, technologies and the existing markets.

### 1. Introduction

In line with the implementation of regional autonomy, the regional government has broader authority in determining the best development policies and programs for improving the welfare of the community and the progress of each region. The background of demography, geography, availability of infrastructure and culture that are not the same, and the capacity of different resources, has consequences for the diversity of regional performance in the implementation and achievement of development goals. Further performance differences will lead to development imbalances between regions, increasing regional demands, and possible disintegration of the nation (Novrilasari, 2008).

Given the limitations/scarcity and inequality of resources, every potential resource available must be utilized as well as possible. This implies that every resource must be utilized as efficiently and effectively as possible (Rustiadi et al, 2011). According to Tarigan (2010), regional development planning cannot be separated from what is currently in the region. Actors creators of regional activities are all communities in the region and outsiders who want to carry out activities in the region. In the development of the regions in general are supported by sectors which are divided into several sectors

as outlined in the Gross Domestic Regional Product (GDRP) so that it can be seen which sectors provide the most input, thus it can be known which one is the leading sector.

Leading sectors are sectors with criteria for having a high growth rate, relatively large employment absorption, having high linkages between sectors both in the future and backward and in creating high added value (Tarigan, 2005). In addition, the leading sectors also generally come from superior sub-sectors or superior commodities from an area or region under study. In the GDRP, sectors are divided into primary, secondary and tertiary sectors. The primary sector consists of the agriculture, forestry and fisheries sectors; and the mining and quarrying sector. Secondary sectors include the building sector, processing industry, electricity, gas and clean water. Whereas the sectors classified as tertiary sectors are those whose production is not physical, such as the services sector; hotel and restaurant trade sector; transportation and communication sector; finance and leasing sector; and company services.

Riau Province in the structure of its GDRP, there are several sectors that have a large contribution as the constituent sector. These sectors are mining and quarrying sector: processing industry sector; and agriculture, forestry and fisheries sector which are classified as primary sectors. These sectors contributed more than 20% in 2010. But along with the development there were sectors that experienced a decline in income. The agriculture, forestry and fisheries sector is one of them, in 2010 this sector contributed 23.46% and continued to decline until 2013 to 19.00%. This decline in income affected the same sector in the

One of the districts affected by this influence is Kuantan Singingi Regency. In Kuantan Singingi Regency, the agriculture, livestock, forestry and fisheries sectors are the sectors that provide the largest contribution, which is almost 50% of GDRP is the contribution of the sector. However, each year this sector has decreased in its development, in 2010 the percentage of the contribution of this sector was 49.44% and subsequently decreased to 49.36% in 2011 and declined again to 47.78% in 2012 and in the year 2013 declined to 47.54%. The largest contribution from this sector was from the plantation sub-sector, which averaged 72% in those years. The decline in income was also followed by a decline in the prices of several commodities in the plantation sub-sector such as rubber and palm oil, the price of rubber at the level of farmers in September 2015 at Rp. 5,770 and the price of palm oil from the farmer level is Rp. 775, the prices of these commodities are very far lower compared to prices in the past year (Plantation Services, 2015). This certainly led to increasingly difficult life of Kuantan Singingi Regency because the majority of the population of Kuantan Singingi Regency worked in the agricultural sector, especially in the plantation sub-sector.

Seeing this condition, there needs to be a research on how the strategy that can be done to develop the area of Kuantan Singingi Regency which utilizes the potential of the region in the leading sectors, so that in the future Kuantan Singingi regency can further optimize its superior sector. Thus it is expected to improve the welfare of the population of Kuantan Singingi Regency.

## **2. Methodology**

The research approach used is quantitative and qualitative approaches. This quantitative approach is used in the analysis of leading sectors, as a basis for determining the leading sector typology and analysis of competitiveness. Qualitative research is used to formulate regional development strategies. The population in this study is the stakeholders related to the development of the region and the leading sectors in Kuantan Singingi Regency namely the regulator and the actors engaged in the field. Determination of the sample in this study is purposive sampling. Consideration in determining the sample is seen from the relationship or interest of the sample or respondent to the research. Respondents selected were respondents who were experts in their fields; Regent, Deputy Regent, Regional Secretary, Head of Service, Experts and Community Leaders

### *2.1. LQ (Location Quotion) Method*

To find out the potential of economic activities which are indicative of the base and non-base sectors, the location question (LQ) method can be used, which is a relative comparison between the ability of the same sector in a wider area. The assumptions in LQ are that there is little variation in geographic expenditure patterns and uniform labor productivity and each industry produces uniform products or services (Rustiadi et al, 2011).

$$LQ_{ij} = \frac{S_{ij}/N_{ij}}{S_i/N_i}$$

Remarks :

- $LQ_{ij}$  = Location Quotient Index sector i in district j  
 $S_{ij}$  = GDRP sector i in distric/city j  
 $S_i$  = GDRP sector i in Province (reference)  
 $N_{ij}$  = total GDRP in the distric/city j  
 $N_i$  = total GDRP in Province (reference)

The interpretation of LQ results is as follows:

1.  $LQ > 1$ , indicates the sector/commodity i is a potential/leading sector in district j, meaning that the sector has an export role in the region.
2.  $LQ = 1$ , it means that the role of the sector/commodity i in the district j is equivalent to the role of the sector in the province (reference).
3.  $LQ < 1$ , indicates that the sector/commodity i is not a potential sector in regency j, meaning that the sector does not have the role of the export sector in the region, instead it will bring imports from other regions.

## 2.2. DLQ (Dynamic Location Quotient) Method

LQ is divided into two types, namely SLQ (Static Location Quotient) and DLQ (Dynamic Location Quotient). DLQ actually has the same principle as SLQ, only to introduce the growth rate is used the assumption that sectoral value added and GDRP has an average growth rate individually during the period between years (0) to year (t). As for the DLQ formula is as the following:

$$DLQ_{IF} = \frac{(1 + g_{ij}) / (1 + g_j)}{(1 + G_i) / (1 + G)}$$

Remarks :

- DLQ = Index of *Dynamic Location Quotient*  
 $g_{ij}$  = Average growth rate of sector or subsector i in the regency  
 $g_j$  = Average growth rate in the regency  
 $G_i$  = Average growth rate of the sector or subsector i in the province  
 $G$  = Average growth rate in the province  
 $t$  = Period of analysis

The interpretation of DLQ result:

1.  $DLQ > 1$  : The proportion of the sector's growth rate (i) to the regional GDRP growth rate (j) is faster than the growth rate of the sector in the reference area GDRP.
2.  $DLQ < 1$  : sector in the GDRP of The proportion of the sector growth rate (i) to the regional GDRP growth rate (j) is slower than the growth rate of the the reference area.
3.  $DLQ = 1$  : Sector growth rate (i) to regional GDRP growth rate (j) is proportional to the growth rate of the sector in the reference area GDRP.



### 2.3. Identifying Leading Sectors Typologies

According to Muta'ali (2015) a combined analysis of LQ (location quotient) and DLQ (dynamic location quotient) is intended to determine the occurrence of shifts and repositioning and to assess the prospect of the existence of the regional economic sector in the future.

**Table 1. Sector Typology Based on LQ and DLQ Values**

	DLQ > 1	DLQ < 1
LQ > 1	Type I Base Sector, Prospective	Type III Base Sector, Unprospective
LQ < 1	Type II Non-Base Sector, Prospective	Type IV Non-Base Sector, Unprospective

Source: Muta'ali, 2015

#### a. Identifying Leading Sectors in Competitiveness Capabilities

The growth of an area will be different from other regions due to differences in the structure of the industry and the economic sector. Shift share analysis is used to analyze changes in various indicators of economic activities such as production and employment opportunities at two time points in an area.

$$PPW = ri \left( \frac{ri'}{ri} - \frac{nt'}{nt} \right)$$

$$PP = ri \left( \frac{nt'}{nt} - \frac{Nt'}{Nt} \right)$$

Remarks :

ri = regional sector i production in the early years

ri' = final year regional sector i production

nt = national sector i production in the first year

nt' = final year national sector i production

Nt = total national production in the initial year

Nt' = total national production in the final year

The interpretation of Shift Share Analysis :

1.  $PP > 0$  = sector i in region j rapid growth
2.  $PP < 0$  = sector i in region j slow growth
3.  $PPW > 0$  = region j has good competitiveness in sector i compared to other regions or region j has a comparative advantage for sector i compared to other regions.
4.  $PPW < 0$  = sector i in the j region cannot compete well when compared to other regions
5.  $PB = \text{net shift} = PP + PPW$
6.  $PB \geq 0$  = sector i growth in j region includes progressive groups (advanced)
7.  $PB \leq 0$  = sector growth in region j is slow

#### b. Formulate Strategy of Regional Development Based on Leading Sector

SWOT analysis involves systematically identifying various factors to formulate management strategies. This analysis is based on logic that maximizes strengths and opportunities, but simultaneously can minimize weaknesses and threats. Technically, SWOT analysis can be done with two methods, Quantitative and Qualitative Models (Muta'ali, 2015). In the research related to the development based on leading sectors in Kuantan Singingi Regency, a Qualitative SWOT analysis was used.

### 3. Results and Discussion

#### 3.1. Location Question (LQ) Analysis

The data used are Kuantan Singingi Regency's GDRP and Riau Province's GDRP in 2014 at current prices. The results of the LQ analysis in identifying the leading sectors of Kuantan Singingi Regency can be seen in table 2:

**Table 2. LQ Value Based on GDRP Based on the Current Price of 2014**

Category	Business Field	GDRP based on current price		LQ
		Kuantan Singingi Regency	Riau Province	
A	Agriculture, Forestry and Fisheries	11,557,111.00	133,769,943.60	2.45
B	Mining and Excavation	2,381,269.10	268,570,836.20	0.25
C	Processing Industry	6,030,422.30	141,859,675.90	1.20
D	Electricity and Gas Procurement	5,302.10	258,778.00	0.58
E	Water Supply, Waste Management, Waste and Recycling	5,038.10	65,787.40	2.17
F	Construction	1,731,062.80	45,437,971.40	1.08
G	Wholesale and Retail Trade; Car and Motorcycle Repair	836,345.00	53,063,664.90	0.45
H	Transportation and Warehousing	102,567.80	4,457,955.80	0.65
I	Provision of Accommodation and Eating Drinks	46,744.40	3,273,305.50	0.40
J	Information and Communication	83,394.10	3,539,376.80	0.67
K	Financial Services and Insurance	157,707.70	5,442,511.10	0.82
L	Real Estate	165,053.60	4,658,529.30	1.00
MN	Company Services	224.70	28,439.40	0.22
O	Government Administration, Defense and Mandatory Social Security	615,225.90	9,246,790.60	1.89
P	Education Services	130,186.10	2,755,174.80	1.34
Q	Health Services and Social Activities	38,790.20	955,160.40	1.15
RSTU	Other Services	96,274.10	2,308,276.90	1.18
	<b>Total</b>	<b>23,982,719.00</b>	<b>679,692,178.00</b>	<b>-</b>

Source :Result of Analysis, 2015

From these sectors can be seen the most leading sectors are the sectors of Agriculture, Forestry and Fisheries with a LQ of 2.45 and the leading sector with the lowest LQ is real estate sector with 1.00. It means that sectors other than the sector potential also has an export role in Kuantan Singingi Regency.

#### a. Dynamic Location Question (DLQ) Analysis

In this DLQ analysis, the 2010-2014 GDRP growth rate data is used. The results of the DLQ analysis can be seen in table 4:

**Table 3. DLQ Value Based on Average GDRP Growth Rate on the Basis of the Valid Price of 2010-2014**

Category	Business Field	Average GDRP Growth Rate on the Basis of the Valid Price		DLQ
		Kuantan Singingi Regency	Riau Province	
A	Agriculture, Forestry and Fisheries	8.93	10.12	1.39
B	Mining and Excavation	10.60	21.86	0.76
C	Processing Industry	10.51	11.02	1.50
D	Electricity and Gas Procurement	7.57	11.93	1.00
E	Water Supply, Waste Management, Waste and Recycling	4.68	2.86	2.58
F	Construction	9.34	15.75	0.93
G	Wholesale and Retail Trade; Car and Motorcycle Repair	10.49	16.43	1.01
H	Transportation and Warehousing	15.20	14.38	1.67
I	Provision of Accommodation and Eating Drinks	18.06	22.88	1.25

J	Information and Communication	6.29	10.93	0.91
K	Financial Services and Insurance	6.88	16.48	0.66
L	Real Estate	12.49	12.96	1.52
MN	Company Services	13.11	18.05	1.15
O	Government Administration, Defense and Mandatory Social Security	10.33	9.13	1.79
P	Education Services	10.10	12.56	1.27
Q	Health Services and Social Activities	14.10	15.64	1.42
RSTU	Other Services	13.25	16.44	1.27
<b>Total</b>		<b>9.61</b>	<b>15.16</b>	

Source: Result of Analysis, 2015

The results of DLQ analysis show that in Kuantan Singingi Regency there are 12 leading sectors of 17 existing business fields in the GDRP. This result is more than the results of the LQ analysis, this shows that in the period of 2010 to 2014 there was an increase and decrease in the rate of income growth in the GDRP of Kuantan Singingi Regency. So that in the development of the Kuantan Singingi Regency, data will be used based on LQ analysis. While DLQ analysis is used to see the superiority of the leading sector by using a combined analysis of LQ and DLQ (Sector Typology Analysis)

*b. Identifying the Leading Sector Typology in Kuantan Singingi Regency*

Regional development based on the leading sectors must pay attention to the typology of the leading sectors, because in the development of the region the aim is to make a region better than before so it is necessary to know whether the leading sector is effective or not. If it is effective, it is feasible to serve as the basis for regional development, and if it is not effective, the strategy development will be directed so that the rate of growth increases and so that in the coming years it is expected to become a sector that is effective. In this sector typology analysis, data from LQ and DLQ analysis are used.

**Table 4. Index of LQ and DLQ According to Business Field**

Category	Business Field	LQ	DLQ
A	Agriculture, Forestry and Fisheries	2.45	1.39
B	Mining and Excavation	0.25	0.76
C	Processing Industry	1.20	1.50
D	Electricity and Gas Procurement	0.58	1.00
E	Water Supply, Waste Management, Waste and Recycling	2.17	2.58
F	Construction	1.08	0.93
G	Wholesale and Retail Trade; Car and Motorcycle Repair	0.45	1.01
H	Transportation and Warehousing	0.65	1.67
I	Provision of Accommodation and Eating Drinks	0.40	1.25
J	Information and Communication	0.67	0.91
K	Financial Services and Insurance	0.82	0.66
L	Real Estate	1.00	1.52
M,N	Company Services	0.22	1.15
O	Government Administration, Defense and Mandatory Social Security	1.89	1.79
P	Education Services	1.34	1.27
Q	Health Services and Social Activities	1.15	1.42
R,S,T,U	Other Services	1.18	1.27

Source: Result of Analysis, 2015

Based on the table 4, sectors will be divided into 4 typologies based on the LQ and DLQ. The results of the sector typology analysis can be seen in the table 5 :

**Table 5. Typology of Sectors**

	DLQ > 1	DLQ < 1
LQ > 1	<b>Type I</b> <b>Leading Sectors, Prospective</b> <ul style="list-style-type: none"> <li>• Agriculture, Forestry and Fisheries</li> <li>• Processing Industry</li> <li>• Water Supply, Waste Management, Waste and Recycling</li> <li>• Real Estate</li> <li>• Government Administration, Defense and Mandatory Social Security</li> <li>• Education Services</li> <li>• Health Services and Social Activities</li> <li>• Other Services</li> </ul>	<b>Type III</b> <b>Leading Sectors, Unprospective</b> <ul style="list-style-type: none"> <li>• Construction</li> </ul>
	<b>Type II</b> <b>Non Leading Sectors, Prospective</b> <ul style="list-style-type: none"> <li>• Electricity and Gas Procurement</li> <li>• Wholesale and Retail Trade; Car and Motorcycle Repair</li> <li>• Transportation and Warehousing</li> <li>• Provision of Accommodation and Eating Drinks</li> <li>• Company Services</li> </ul>	<b>Type IV</b> <b>Non Leading Sectors, Unprospective</b> <ul style="list-style-type: none"> <li>• Mining and Excavation</li> <li>• Information and Communication</li> <li>• Financial Services and Insurance</li> </ul>
LQ < 1		

Source: Result of Analysis, 2015

*c. Identifying of Leading Sector Competitiveness*

To determine the competitiveness of leading sectors, the Shift Share analysis is used. Furthermore, the data used in this analysis are the GDRP of Kuantan Singingi Regency and Riau Province. The results of the analysis can be seen in the following table 6 :

**Table 6. Result of Shift Share Analysis Based on GDRP Kuantan Singingi Regency in year 2010 dan 2014**

Category	Business Field	PPW	PP	PB
A	Agriculture, Forestry and Fisheries	0.725579226	0.109717044	0.83529627
B	Mining and Excavation	1.023178944	-0.099737347	0.923441597
C	Processing Industry	0.830949412	0.087643562	0.918592974
D	Electricity and Gas Procurement	0.63581837	0.096685574	0.732503944
E	Water Supply, Waste Management, Waste and Recycling	0.303431488	0.324218875	0.627650363
F	Construction	0.870144578	-0.013092873	0.857051705
G	Wholesale and Retail Trade; Car and Motorcycle Repair	0.938601752	-0.021206494	0.917395258
H	Transportation and Warehousing	1.173982542	0.013343923	1.187326465
I	Provision of Accommodation and Eating Drinks	1.499257853	-0.128137025	1.371120828
J	Information and Communication	0.61097229	0.09062963	0.70160192
K	Financial Services and Insurance	0.576050119	-0.026405266	0.549644853
L	Real Estate	0.986195235	0.043040102	1.029235337
M,N	Company Services	1.12015194	-0.055287032	1.064864908
O	Government Administration, Defense and Mandatory Social Security	0.766415248	0.13530343	0.901718678
P	Education Services	0.842577103	0.055064756	0.897641859
Q	Health Services and Social Activities	1.131709293	-0.011543175	1.120166118
R,S,T,U	Other Services	1.086331784	-0.024861324	1.061470459

Source: Result of Analysis, 2015

Based on table 6 above, it can be seen that the sector with rapid growth is the Water Supply, Waste Management, and Recycling Sector with proportional growth value (PP) 0.324218875 and the slowest growth sector, namely the Provision of Accommodation and Drinking Sector with PP value -

0.128137025. Furthermore, to see the competitiveness of leading sectors can be seen in the value of regional share growth (PPW). The competitiveness of the leading sectors of Kuantan Singingi Regency can be seen in table 7 :

**Table 7. Competitiveness of Leading Sectors in Kuantan Singingi Regency in year 2010 dan 2014**

Category	Lapangan Usaha	PPW
A	Agriculture, Forestry and Fisheries	0.725579226
C	Processing Industry	0.830949412
E	Water Supply, Waste Management, Waste and Recycling	0.303431488
F	Construction	0.870144578
L	Real Estate	0.986195235
O	Government Administration, Defense and Mandatory Social Security	0.766415248
P	Education Services	0.842577103
Q	Health Services and Social Activities	1.131709293
RSTU	Other Services	1.086331784

*Source: Result of Analysis, 2015*

In table 7 it can be seen that the competitiveness of all leading sectors is classified as having good competitiveness, this is because the PPW value of each sector is > 0. So that in the development of the region in the future Kuantan Singingi Regency will be more based on *leading sectors*.

*d. Formulate Strategy of Regional Development Based on Leading Sector*

The analytical tool used in formulating strategy of regional development based on leading sectors in Kuantan Singingi Regency is a SWOT analysis of qualitative methods.

**Table 8. SWOT Matrix of Regional Development Strategy Based on Leading Sectors In Kuantan Singingi Regency**

	<u>STRENGTH (S)</u>	<u>WEAKNESS (W)</u>
<b>Internal Factors</b>	<ol style="list-style-type: none"> <li>There is sufficient local resources are 9 leading sectors in Kuantan Singingi Regency with good competitiveness, and 8 of them are prospective.</li> <li>Market availability from each of the leading sector products</li> <li>The large number of workers, especially the plantation sub-sector in the agriculture, forestry and fisheries sectors.</li> <li>The interest of investors from various regions, both local and foreign, who invest in the production of leading sectors.</li> <li>Government support in the fields of leading sectors, both in the form of capital and guidance and supervision.</li> <li>Availability of a good transportation network and an appropriate communication network for the continuity of leading sectors.</li> <li>Appropriate use of technology in leading sectors.</li> </ol>	<ol style="list-style-type: none"> <li>The existence of a leading sector that is not prospective, namely the construction sector and low productivity from leading sectors.</li> <li>There is not even market distribution for superior sector products in each sub-district.</li> <li>The presence of labor with a low educational classification.</li> <li>An investment climate that tends to be unstable.</li> <li>Lack of data related to leading sectors, especially spatial data such as land use.</li> <li>There are still transportation and communication networks with inadequate conditions.</li> <li>The technology that is used generally only produces goods in the leading sectors into semi-finished goods such as in the agricultural sector.</li> </ol>
<b>External Factors</b>		
	<u>OPPORTUNITY (O)</u>	<u>STRATEGY S-O</u>
	<ol style="list-style-type: none"> <li>Optimizing the production of leading sector products.</li> <li>Promotion of leading sector products to other regions both domestic and foreign.</li> </ol>	<ol style="list-style-type: none"> <li>Optimizing the production of leading sector products to meet market needs of each leading sector (O1, S1, S2).</li> <li>Expand product marketing reach of leading sectors with promotion to domestic and foreign regions. (S2, O2)</li> </ol>
		<u>STRATEGY W-O</u>
		<ol style="list-style-type: none"> <li>Increase the income of leading sectors that are not prospective by optimizing production and promotion. (W1, O1, O2)</li> <li>Developing new products markets for leading sectors by building and</li> </ol>

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| <ol style="list-style-type: none"> <li>3. Training of workers in the fields of leading sectors.</li> <li>4. Partnership between investors and stakeholders related to the leading sectors.</li> <li>5. Regulations related to the development of leading sector-based regions.</li> <li>6. Equitable development of transportation network infrastructure and communication networks.</li> <li>7. Utilization of technology in upstream and downstream industries in leading sectors</li> </ol> | <ol style="list-style-type: none"> <li>3. Maximizing the function of the number of local workers available for training in the leading sectors. (S3, O3)</li> <li>4. Increasing investor interest by building partnerships between stakeholders related to investors in leading sectors. (S4, O4)</li> <li>5. Guidance and supervision by creating regulations related to the development of regions based on leading sectors. (S5, O5)</li> <li>6. Improve the development of transportation and communication infrastructure to create equitable infrastructure development. (S6, O6)</li> <li>7. Optimizing the role of appropriate technology so that it can utilize the development of upstream and downstream industries in the sectors of leading sectors. (S7, O7)</li> </ol> | <p>promoting the products of other leading sectors. (W2, O2)</p> <ol style="list-style-type: none"> <li>3. Improve the quality of education and the development of skills training institutions for workers in the leading sectors. (W3, O3)</li> <li>4. Minimizing possible losses due to an unstable investment climate by building partnerships between investors and related stakeholders. (W4, O4)</li> <li>5. Increasing the availability of more complete data related to leading sectors and developing clearer regulations related to the development of leading sector-based regions. (W5, O5)</li> <li>6. Improving transportation and communication network infrastructure for equitable development. (W6, O6)</li> <li>7. Utilizing technology in the upstream and downstream industries in leading sectors to create products into finished goods. (W7, O7)</li> </ol> |
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**TREATHS (T)**

**STRATEGY S-T**

**STRATEGY W-T**

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. Import dependence of several superior sector products.</li> <li>2. Competition on the same product at the level of global marketing.</li> <li>3. Increased unemployment of workers due to the excessive amount of labor</li> <li>4. Competition between local investors and foreign investors</li> <li>5. Regulation violations due to weak enforcement and the existence of regulations that are still unclear regarding leading sectors, making the government difficult to take action.</li> <li>6. Gaps in the development of transportation and communication infrastructure between sub-districts that are on the primary route with secondary and tertiary</li> <li>7. Decreasing environmental quality due to activities that use environmentally friendly technology in the production of leading sectors.</li> </ol> | <ol style="list-style-type: none"> <li>1. Increase the production of leading sectors in reducing imported products in the sectors of leading sectors. (S1, T1)</li> <li>2. Improving product quality leading sectors in the face of competition in the global market. (S1, S2, T2)</li> <li>3. Improving the quality of local workforce and expanding employment in leading sectors in overcoming unemployment. (S3, T3)</li> <li>4. Increasing the interest and role of local investors but still not ignoring foreign investors, by providing incentives and disincentives to invest in leading sectors. (S4, T4)</li> <li>5. Increasing support for both capital and guidance and supervision by socializing existing regulations related to the development of leading sectors, so that violations can be minimized. (S5, T5)</li> <li>6. Increasing the development of transportation and communication infrastructure to overcome infrastructure development gaps. (S6, T6)</li> <li>7. Reducing the use of technologies that damage the environment and replace with more environmentally friendly technologies. (S7, T7)</li> </ol> | <ol style="list-style-type: none"> <li>1. Increase the income of leading sectors that are not prospective by reducing imported products. (W1, T1)</li> <li>2. Formulate regulations related to the development of leading sector-based regions and the provision of data related to leading sectors to reduce violations. (W5, T5)</li> <li>3. Improving the condition of transportation and communication networks in sub-districts that need to address the gap in transportation and communication infrastructure between sub-districts. (W6, T6)</li> <li>4. Optimizing semi-finished industries by improving the quality of product quality and starting to develop finished goods products, but still prioritizing environmentally friendly technologies. (W7, T7)</li> </ol> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

*Source: Result of Analysis, 2015*

**4. Conclusion**

Based on the results of the analysis and discussion, some conclusions can be drawn:

- a. Of the 17 existing business/sector fields in Kuantan Singingi Regency, there are 9 sectors which are the leading sectors, including the categories (A) Sector of Agriculture, Forestry and Fisheries, (C) Processing Industry Sector, (E) Water Supply Sector, Waste Management, Waste and Recycling, (F) Construction Sector, (L) Real Estate Sector, (O) Government Administration, Defense and Mandatory Social Security Sector, (P) Education Services Sector, (Q) Health Services Sector and Social Activities, (R, S, T, U) Other Services Sector.
- b. Based on the typology of the leading sectors, one of them is the leading sector of the type that is not prospective or classified as type III is construction sector, while the remaining 8 leading sectors are classified as type I, namely the leading prospective sector.
- c. The leading sectors are classified as leading sectors with good competitiveness, this can be seen from the results of the shift share analysis that produces  $PPW > 0$ .
- d. The formulation of strategies based on regional components is optimizing existing local resources by improving the quality of labor, transportation and communication components, leading sector products and utilizing existing government capabilities, technology and markets.

## 5. Acknowledgements

This work is partially supported by Urban and Regional Planning Departement, Faculty of Engineering, Islamic University of Riau.

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# Biostratigraphy Analysis in Determining The Age and Depositional Environment at Telisa Formation, Desa Tabing Kampar, Riau

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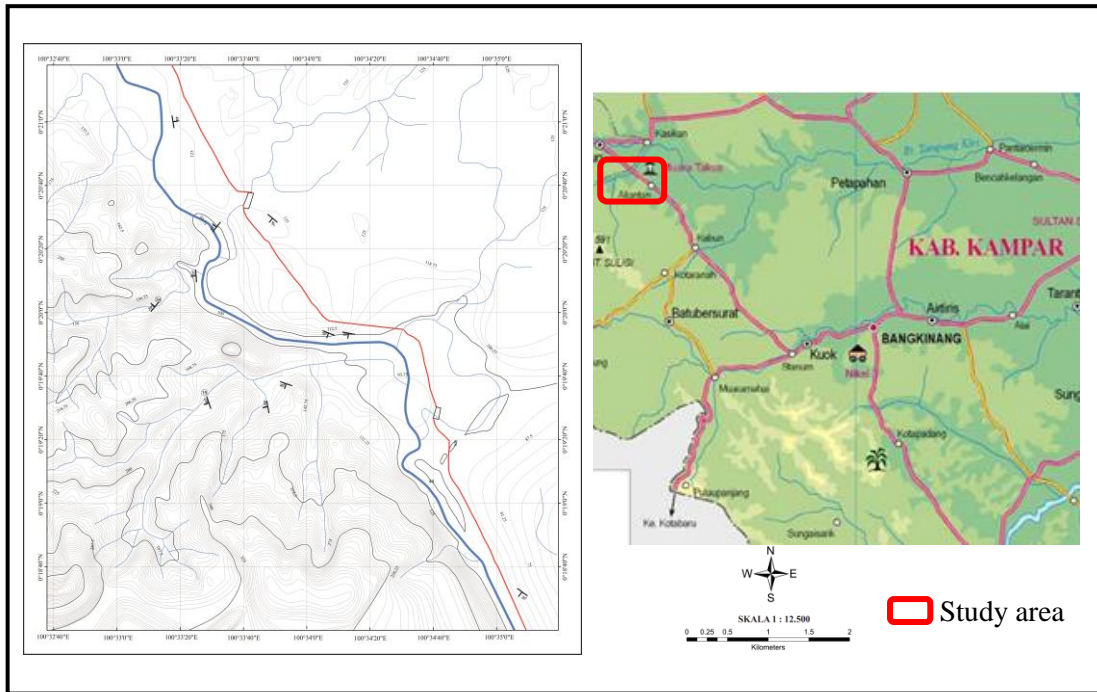
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**Abstract.** The study area is located in Tabing village, Kampar, Riau, which is included in Telisa Formation, Central Sumatra basin. Telisa Formation is a seal or cap rock of the petroleum system in the Central Sumatra basin. Biostratigraphy analysis was determine in two stages, the first stage is field data aquisition using channel sampling analysis method by conducting lithological data of each layers and producing simple log outcrops. The second stage is data processing that has been conducted in the laboratory by washing and drying the rock sample until the analysis phase under binocular microscope. Planktonic foraminifera analysis would be given the relative age and foraminifera bentonic analysis would obtained the depositional environment of the study area. Lithology of the study area consist of shale and sandstone. Microfossil analysis from both lithology indicated that relative age of the study area is in Middle-Upper Miocene (N9-N21) and the depositional environment is in the Middle Neritic (20-100m).

## 1. Introduction

The study area is located in the Tabing village, Kampar, Riau. Planktonic foraminifera is widely distributed in open seas generally at more than 10m depth by way of life hovering on the water. Planktonic foraminifera were commonly used to determine the relative age of a lithological units (Bolli, 1985). Meanwhile, Bentonic foraminifera live in the sediment layer at the bottom of the sea and existing in almost all marine and transitional environments. Bentonic foraminifera can be used as an indicator of an ancient depositional environment and paleobathymetry (Pringgoprawiro and Kapid, 2000). Determination of age and depositional environment had been used in qualitative and quantitative analysis. Qualitative analysis was determined using classification based on foraminifera bentonic (Phleger, 1951). And quantitative analysis was identified by calculating the planktonic and bentonic ratios and classifying them based on interpretation of pelagic ratio, depth and bathymetry environment (Tipsword et al, 1966).

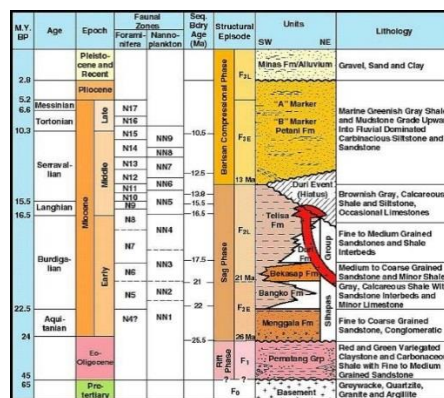




**Figure 1.** Administration map of Kampar Regency, Riau Province

**2. Geological Setting and Regional Stratigraphy**

Geologically, Kampar Regency is located in Central Sumatra Basin, which is a back arc basin that develops along the west and south coasts of the Sunda Shelf in the southwestern part of Southeast Asian. The Central Sumatra Basin consists of a succession of tertiary sediments overlying a complex pre-Tertiary lithology, bounded in the southwestern part of the basin by Barisan mountains, eastern part of the basin by Malaysian Shield and in the northern part of the basin by Asahan Arch, as the boundary at southern part of the Central Sumatra Basin is not well defined (Eubank and Makki, 1981). The traditionally accepted boundary geographic one is drawn as a north-southwest line through the Kampar High and Tiga Puluh Mountains (Heidrick and Aulia, 1993). The study area was in the Telisa formation which was deposited in the middle Miocene to upper Miocene (N9-N21) with a Middle Neritic (50-100m) bathymetry environment. The lithology is composed of sedimentary rocks dominated by shalestone with calcareous siltstone insertion, brownish gray and sometimes limestone was found. Depositional environment of study area is Middle Neritic to Upper Bathyal (Dawson et. Al., 1997). The thickness of this formation is up to 1600ft. This formation, known as cap rock from the Sihapas Group reservoir in the Central Sumatra Basin that have relationship with the Bekasap Formation in the southwest and the Duri Formation in the northeast of Central Sumatra Basin (Yarmanto, 1997).



**Figure 2.** Central Sumatra Regional Stratigraphy (Heidrick & Aulia, 1996)

### 3. Result and Discussion

There are two lithologies at the research study area, i.e. carbonate claystone and carbonated very fine sandstone.

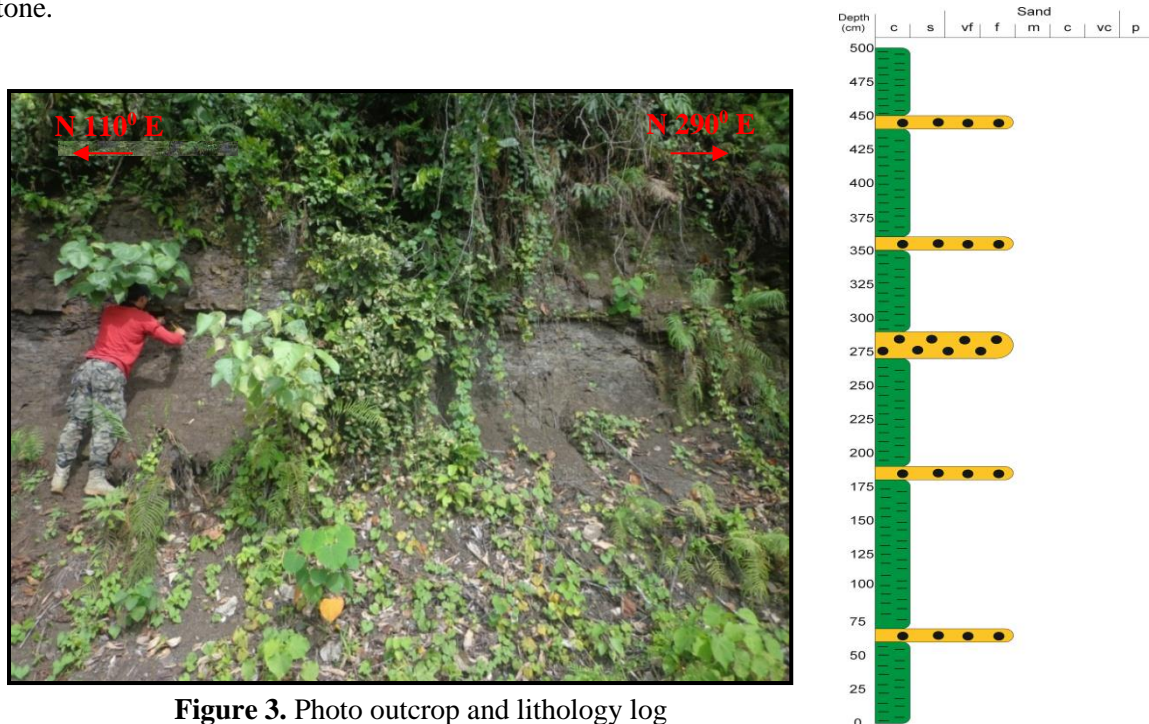


Figure 3. Photo outcrop and lithology log

In this outcrop there are 11 layers between claystone and very fine sandstone, this outcrop has 5m height and 10m length. The first layer, a claystone, has 80cm thickness, has a weathered brownish gray color, fresh blackish gray color, clay in grain size, well-rounded, well sorted, carbonate, slightly soft compactness, parallel laminated structure. In the second layer, very fine sandstone, has 10cm thickness, has a weathered gray color, fresh yellowish gray color, the grain size is very fine sand, well-rounded, well sorting, carbonate, slightly soft compactness. The third layer, claystone, has 100cm thickness, the fourth layer, very fine sandstone, with 10cm thickness, the fifth layer, claystone with 80cm thickness, the sixth layer, very fine sandstone with 20cm thickness, the seventh layer, claystone with a thickness of 60cm, the eighth layer, very fine sandstone with 10cm thickness, the ninth layer, claystone, with 80cm thickness, the tenth layer, very fine sandstone with 10cm thickness and the eleventh layer, claystone with 60cm thickness.

In the study area, there is 326 fossils of planktonic foraminifera with 6 different species, and 10 fossils of benthic foraminifera from 3 different species.

**Table 1.** Range of age of Planktonic foraminifera (Blow, 1969)

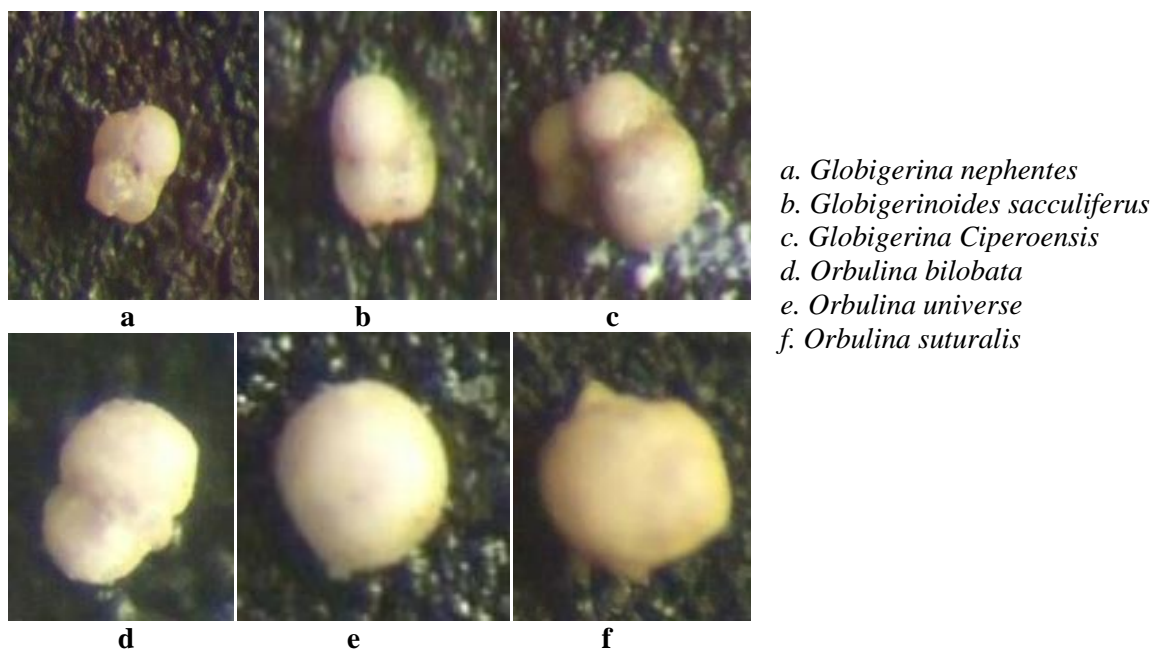
Name of Fossil	Amount	Age																						
		Oligocene			Miocene															Pliocene			Quarter	
					Lower					Middle					Upper									
N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12	N13	N14	N15	N16	N17	N18	N19	N20	N21	N22	N23		
<i>Globigerina Ciproensis</i>	61																							
<i>Globigerinoides</i>																								
<i>Sacculiferus</i>	41																							
<i>Orbulina Bilobata</i>	63																							
<i>Orbulina Universe</i>	82																							
<i>Orbulina Suturalis</i>	46																							
<i>Globigerina nephentes</i>	33																							

the bathymetry zone was determined using analysis of benthic foraminifera that found in the study area. In the study area there were 3 species of benthic foraminifera, 5 *Bolivina* sp, 4 *Bulimina subornata*, and 1 *Cancris oblongus*.

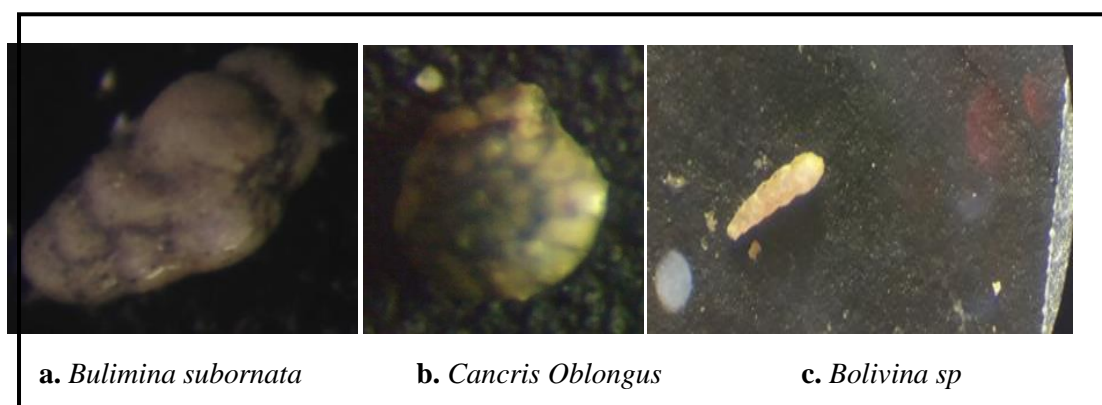
**Table 2.** Depositional Environmentdetermination based on depth of Benthic foraminifera ratio(Tipsword et al, 1966).

Name of Fossil	Amount	Zone Bathymetri				
		Neritic			Bathyal	
		Inner 20 m	Middle 100 m	Outer 200 m	Upper 500 m	Lower 1000 m
1. <i>Bolivina SP</i>	5					
2. <i>Bulimina subornata</i> <i>BRADYI</i>	4					
3. <i>Cancris Oblongus</i>	1					

From the data and analysis of planktonic foraminifera, the age of the study area is at Middle Miocene-Upper Miocene (N9-N21). The analysis of Benthic foraminifera is to determine the depositional environment. In the study area there is 3 benthic foraminifera species, namely *Bolivina* sp, *Bulimina subornata*, and *Cancris oblongus*. From the abundance of the benthic foraminifera fossil, the depositional environment can be found in 50-100m depth, Middle Shelf (Deep Middle Shelf).



**Figure 4.** Planktonic Foraminifera



**Figure 5.** Benthic Foraminifera

#### 4. Conclusion

The study area was in the Telisa formation, which is a cap rock in the petroleum system of central Sumatra basin with lithology very fine sandstone and claystone. The age of the study area is at Middle Miocene - Upper Miocene (N9 - N21), known from the analysis of planktonic foraminifera, *Globigerina nephentes*, *Globigerinoides sacculiferus*, *Globigerina Ciproensis*, *Orbulina bilobata*, *Orbulina universe*, and *Orbulina suturalis*. The bathymetry environment in the study area is at depth of 50-100 m or in the Middle Neritic environment determined from the analysis of Benthic foraminifera, *Bulimina subornata*, *Cancris Oblongus*, *Bolivina sp*.

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# Academic Data Warehouse Planning: A Case Study in Politeknik Caltex Riau

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**Abstract.** Politeknik Caltex Riau (PCR), as a private higher education institution with ten study programs, has already had a Student Academic System. The university management has been creating policies based on their intuitions, rather than on academic data. The current academic data available are still partial and spread in many sources. Some of them have used operational data, while some others are still in the form of files, hindering the operational staff to analyze the data to get the information required by the university's top management. Data warehouse technology is one of possible solutions in data analysis. Methodology in building a data warehouse is nine step kimball. In this study, the data warehouse modeling technique used was Fact Constellation. The study planned an academic data warehouse that was implemented using the software Pentaho and visualized graphically with the software Tableau. Data warehouse planning in the current study used the steps available for developing a data warehouse. The result of this research is a data warehouse that presents comprehensive information, relevant and integrated and can be viewed from various viewpoints, which is expected to facilitate in decision making. Information were presented as a data warehouse plan and visualized graphically.

## 1. Introduction

Politeknik Caltex Riau (PCR), as a private higher education institution with ten study programs, has already had a Student Academic System. The university's top management has been developing policies based on their intuitions without using the available academic data. The current academic data are still partial and spread in many sources; some have used operational data and some are still in the form of files; therefore, it hinders the operational staff to analyze the data to gain information that is needed by the top management.

The information needed by the management is as follows: the number of students per batch, the number of students based on gender, the students' origin of places, and students' grades, and their status. Those data are collected from the academic database and other sources of data in different forms such as flat file using Microsoft Excel and others. Data processing is used to process data to be information that has functions. The more data available and the more complex the data in an organization, the more important a correct data processing is needed to be implemented. One of the data processing methods is data warehouse technique that is used as a tool to analyze data.

Data warehouse is a subject-oriented, integrated, time-variant and non-volatile collection of data in support of management's decision-making [1]. Data warehouse architecture consists of structures or components that support one another in data warehouse building. [2]. Methodology in building a data warehouse is nine step Kimball. Nine step kimball is the methodology proposed by Ralph Kimball in building Data Warehouse.[3]

Data warehouse modeling technique used in the current study was Fact Constellation technique. Fact constellation scheme is a dimensional modeling for data warehouse that has more than one fact tables dividing one or more dimension tables. This scheme is more complex than the Star scheme since it has

various fact tables. In fact constellation scheme, a dimension table can be used in several fact tables; thus, the design is more complex.

The data collected for the study were obtained from student academic data from batch 2014 to 2017 at PCR. The objectives of the study were to develop data warehouse by using fact constellation modeling technique, to analyze data of the students seen from several dimensions, and to visualize the data graphically. While the purpose of the research is to produce data warehouse using Fact Constellation and produce information about the student dimension pattern in the field of academics for the management of institution.

## 2. Literature Review

### 2.1. Data warehouse

Data warehouse is data collection process that is subject-oriented, integrated, time varied, and non-volatile. It is used to support strategic decision-making process for an organization. Data warehouse contains the extraction of various corporate operating systems, each of which holds different records from every business transaction.[4]

The data warehouse characteristics are as follows [5]

1) Subject-oriented, which covers the subject or main business entities in an organization such as the lecturers, students, subjects, grades, and curriculum. Data warehouse is designed to facilitate thorough analysis of data in a considerable amount. The data arranged by subject only contains important information for Decision Support System (DSS) processing. The information stored in the database is classified by particular subjects, for instance, in library case, members and books. The data in every subject is summarized into dimensions, such as time period; thus, historical data can be provided for analysis.[6]

2) Integrated, with the data collected from operational data and external data which are integrated in a data warehouse in order to get a single data base to support a decision.

The data in data warehouse can be obtained from several separate sources. This data will be stored in the same segment in a specific and consistent format. The data in data warehouse is sourced from operational database (internal source) and from outside of the system (external source). Data warehouse can store the data from separate sources in a consistent and integrated format.[6]

3) Time-variant, with the data that are collected in data warehouse contain time dimension to identify trend, predict future operations, and controlling operational target.

Data warehouse stores historical data useful for analysis and decision-making. The data in data warehouse is characterized as time-series data in the form of time-variant historical data. This function is geared to perform trend analysis of the data. Some ways of looking into time interval in measuring the accuracy of a data warehouse include the following: a) presenting data warehouse at a particular time interval, which is the simplest one, b) using time variance presented within the data warehouse, either explicitly using time units, such as day, week, months and particular time or implicitly and c) using time variance presented by data warehouse through a long set of snapshots.[6]

4) Non-volatile, where the data available in data warehouse are not updated in real time, but refreshed regularly from the operational system. New data are always added to update the database.

The data stored within a data warehouse cannot be changed. Unlike the data in the OLTP system, the data in a data warehouse is not updated in real time/continuously (by applying the insert, update and delete functions); the data can only be viewed or added with new data. In a data warehouse, only two data manipulation activities can be conducted, namely data loading (extracting data) and data access (accessing the data warehouse). The data in a data warehouse is uploaded on a periodic basis in the same period.[6]

### 2.2. Data warehouse architecture

The data stored in the Data Warehouse are from numerous sources, for example operational or transaction database and external data sources such as webs, information service providers, data from competing companies, to name but a few. Figure 1 represents a Data Warehouse architecture.

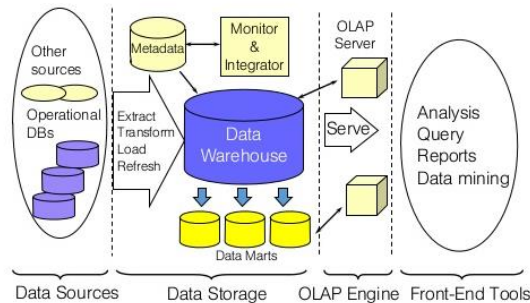


Figure 1 Arsitektur Data Warehouse [7]

Data Warehouse contains a number of key elements, namely [6]:

1. Data sources used by Data Warehouse, namely operational or transaction database and external data sources. Online Transaction Processing (OLTP) is an explanation of all activities and systems related to reliable data input into database.

Business operational systems are usually focused on keeping a record of transactions that have been made at different business operating points. Hence, they are characterized as OLTP (Online Transactional Processing) systems. An OLTP database normally contains data specific to business processes, such as sales, production, finance among others.[8]

In data staging, the data collected from various data source need to be modified, converted and made in formats suited to query and analysis purpose. Three functions that must be performed to reach data preparedness include extraction, transformation and loading of data to a data warehouse storage called staging area.[9]

2. Extraction, Transformation, Loading (ETL) process from data source to Data Warehouse Database. ETL is a process in which we migrate from operational database to Data Warehouse.
3. Metadata, which outline the structures and several meanings of data, and as such supports effective or ineffective use of the data.

Dictionary or catalogue of data containing information on the data itself, for instance, structure, file information, index among others. [9]

4. Online Analytical Processing (OLAP) is the use of a set of graph tools, which provides users with a multi-dimensional view. OLAP (Online Analytical Processing) is a dynamic synthesis, analysis and consolidation of big-sized multi-dimensional data. [10]

5. Data Warehouse Database, which contains detailed data and the summary of the data contained in the Data Warehouse database.

Data warehouse has a separate repository for storing data. Data repository is geared to maintain historical data in data warehouse in a large volume for analysis purpose, for which the structure is customized. Data warehouse is a read-only data repository because for it to be used for analysis, the data must be in a stable state, which reflects to the state of data in a certain period of time; thus, the data stored in data warehouse is put in unupdated state.[9]

6. User, the one utilizing the Data Warehouse.

### 2.3 Nine-step methodology

Data warehouse planning method used was based on the Nine-step methodology from Kimball. The steps were[11]:

1. Selection of the process: The data mart that is built first must be the one that can be transferred in a timely manner and address all important business queries. Data mart is a database containing data that only describes segments of corporate operations.[10].



2. Identification of the grain: To decide for certain what is represented by a fact table. Grain is a process in which what will be described by a record in a fact table is determined.[12]
  3. Identification and adjustment: A well-built dimension set, making it easy to understand and use data mart, this dimension is essential for describing the facts contained in a fact table. In this stage, an adjustment of dimension and grain presented in the form of a matrix is done.[13]
  4. Identification of facts: The source of a fact table determines which facts are usable in the data mart. All facts must be expressed at a level predetermined by the source.
  5. Storage of pre-calculation data in tables: Storing pre-calculation in the fact table.
  6. Declaring the dimensional table: In this stage, complete information is inserted into the dimensional table. Textual description is added to possible dimensions too. The textual description must be easy for users to use and understand. [14]
  7. Selection of database duration: For instance, in an insuring company, data must be stored for a duration of 10 years or more. Selection of duration of historical data belonging to a hospital can be performed according to the information need. In most cases, the more the data is transferred into a data warehouse, the more complete the information is generated. Attention should be paid to the duration of historical data by taking into account the existing data content and format. Care must be exercised so as to avoid transferring useless junk data.[13]
  8. Tracking the dimensional changes slowly: Tracking slow dimensional change. The following are three types of slow dimensional change:
    - Type 1. The attributes of a dimension that has changed are rewritten
    - Type 2. The attributes of a dimension that has changed make new dimensions
    - Type 3. The attributes of a dimension that has changed make an alternative, allowing the values of the old and new attributes to be accessed simultaneously at the same dimensions.
  9. Determining priority and query mode: In this stage, physical planning is required. The effect of physical planning, such as the sorting of the fact tables in the disk, and the location of initial storage of summaries or aggregate are taken into consideration. [13]
- All of the steps above should be taken before a data warehouse is implemented. The next stage is implementing simple data warehouse or data mart.[9]

#### *2.4. Data warehouse modeling*

Dimensional Model scheme that was used to develop the data warehouse in this study was Fact Constellation Scheme. This scheme is considered as constellation scheme since there is a dimensional table used simultaneously by one or more fact tables. [15]

Fact Constellation Schema is a schema comprising several fact tables that share the same dimensional table. This schema can be viewed as a star constellation, thus it is often called the galaxy schema. [16]

Fact constellation schema is more complex than star schema as it contains various fact tables. In fact constellation schema, one dimensional table can be used in several fact tables, thus requiring a more complex design. An advantage of fact constellation schema is its ability to model business more accurately using some fact tables. However, it is difficult to manage and has a complex design.[17]

Characteristics fact table: [3]

- Concatenated key. Lines in the fact table by using primary keys from dimension tables, the primary key of the fact table is the primary key of all dimension tables.
- Data grain, is the level of detail for measurement. For example, the number of orders corresponds to a certain number of products on an order, a specific date, for a specific customer and is sold by certain specific sales specifics. If the number of items is seen as the number of products per month, then the data grain is different and at a higher level.

- Tables with more data from the dimension table. Specific fact tables have more attributes than the dimension table, but have a greater number of records.
- Describe data. The fact table does not need to save a record whose value is zero.
- Dimension of degeneration. Data elements appear from operational systems which are not in the form of facts, such as order numbers, bill numbers, and others. But those attributes can be useful in certain types of analysis. For example, finding the average number of products per order, the product must go through the number of orders to get an average value. These attributes are called degeneration of dimensions and space as attributes of the fact table.

### 2.5. Etl process planning

ETL process, or Extract, Transform, and Load, is a data processing that change it from OLTP database into data warehouse. ETL process is part of data staging. The process changes, re-formats and integrates data that are obtained from one or more OLTP systems [19].

ETL is a critical process in data warehousing. With ETL, the data from the operational activity can be inserted into the data warehouse. ETL can also be used for integrating data with the existing system. The purpose of ETL is to collect, filter, process and combine relevant data from various sources to be stored in the data warehouse. ETL process results in data that meets the data warehouse criteria, such as being historical, integrated, summarized, static and in a structure designed for analysis purpose. [20]

#### 1. Extraction

The first stage of ETL process is to extract data from data sources. Most data warehouse projects combine data from different sources. There is a high chance that separate systems use different data formats. Extraction is converting data into a format which will be useful for transformation process.[20]

#### 2. Transformation

Data transformation is a phase where data that have been extracted are changed into raw data that are suitable to be used in data warehouse.

Transformation stage uses a set of rules or functions to extract data from the source and subsequently to input the extracted data into data warehouse. The following are what can be done in the transformation step: [20]

- Select certain columns to be inserted into the data warehouse;
- Translate values in the form of code;
- Encode the values into a free form (for example, map “Male” as “M” and “Female” as “F”);
- Conduct calculation of new values (for example, value = qty \* unit\_price);
- Combine data together from various sources;
- Make a summary from some data rows;
- Generate surrogate key value;
- Conduct transposing or pivoting (convert a set of columns into a set of rows, and vice versa);
- Split a column into some columns and
- Use various forms of data validation, both simple and complex.

#### 3. Loading

Loading is a process to transfer data physically from OLTP system into data warehouse.

Loading phase is a stage in which data is inserted into the final target, mostly a warehouse data. How much time taken for this process will depend on the organization’s need. [20]

### 2.6 Data warehouse tools

The following are the tools used by users for various purposes after a Data Warehouse is established: [4]

#### 1. OLAP (On-Line Analytical Processing)

OLAP is one of Data Warehouse tools used for data analysis. OLAP is a technology designed to provide superior performance for ad hoc business intelligence queries [21]. OLAP is designed to operate efficiently with data organized following general dimension models normally used in Data Warehouse. The following are ways in which OLAP is useful [5].

- a. OLAP improves productivity of manager, executive and business analysis.
- b. Effectively using OLAP enables users make their own analyses confidently without the help of IT assistance.
- c. OLAP greatly benefits IT developers, in that it is highly useful for improving the performance of their applications.
- d. OLAP improves work efficiency. OLAP may be used for the following:[22]

2. Pentaho

Pentaho Kettle is open-source software released by Pentaho corp, which is based in Orlando, the United States. The main elements of Pentaho Kettle are transformation and job. Transformation is a set of instructions for converting input into desired output, while job is a set of instructions for executing transformation. [23]

3. Reporting

Reporting tools are the tools used to help users retrieve historical or current data and undertake some statistical analysis standards [24]. The data generated from the reporting tools can take the form of either normal report or graphics. The tool used for reporting is Tableau.

Tableu is easy to use, especially in making data visualization, data analysis and reporting, owing to drag and drop system it uses. Tableu is capable of combining data from various data sources, such as spreadsheet, database, cloud data and big data into one program to be used in a dynamic analysis. [25]

**3. Research Methodology**

*3.1 Research Steps*

Research stages applied in this research is illustrated in the flowchart below:

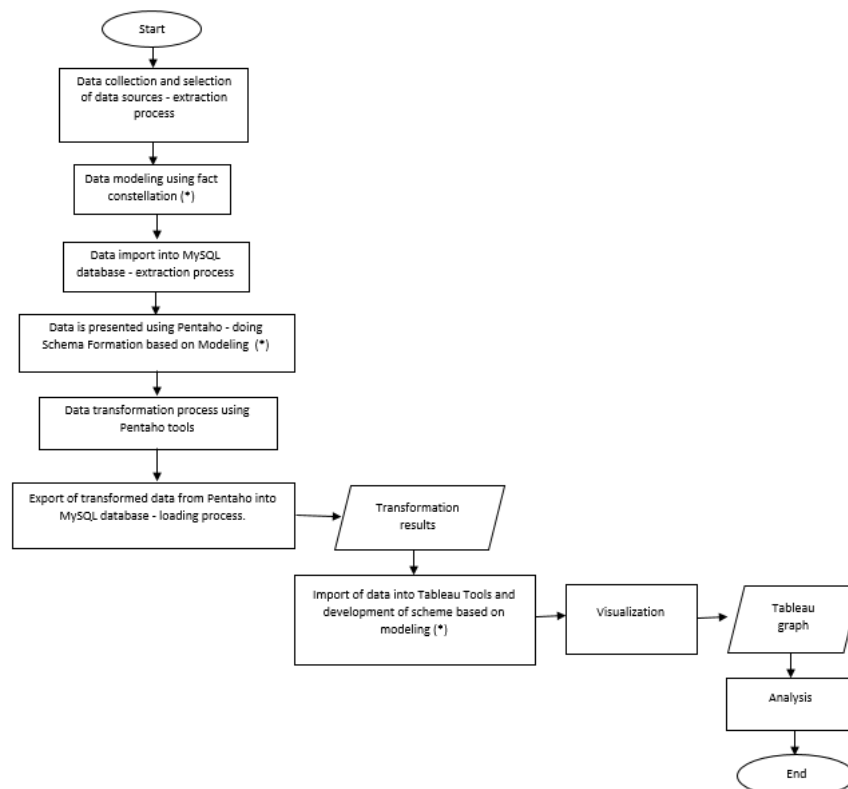


Figure 2 Research stages

Legend:

- a. Initial planning process that collected and selected master data sources from organization (extraction). Data sources were the input for the study.
- b. Data warehouse scheme modeling using fact constellation (scheme development)
- c. Master data collected was imported into mysql database (extraction).
- d. The data were processed with Pentaho tools (transformation). In Pentaho, scheme was developed based on scheme modeling and process transformation (selection, data cleaning and joining).
- e. Loading of transformed data into database (loading).
- f. Scheme development based on scheme modeling in the tableau.
- g. Visualization of transformed data using Tableau Tools in order to get data that are comprehensible and provide new information (transformed data and visualized data in graphs that became the object of the analysis were the output of the study).

### ***3.2 Preparation stage***

Preparation stage was the initial stage in the study that selected the background and the scope of the research to limit the discussion before problem statement was set and research objectives, importance of the study and writing system were set.

### ***3.3 Theoretical framework stag***

In this stage, review was performed on theories related to the study such as fundamental theory on academic information system and theory on planning and implementation of data warehouse. Review was also performed on similar research journals as well as other supporting theories.

### ***3.4 Data collection stage***

Methodology used to develop the data warehouse in this study was the Nine-Step Methodology. The object of the study was PCR. The methods used to collect data in the current study were as follows:

- (a) Observation is a data collection method that contains detailed and systematic note-taking through direct observation and interview with respective parties in the university in order to get information needed. The data collected from PCR was:
  - a. Master data on students
  - b. Master data on subjects
  - c. Master data on lecturers
  - d. Master data on students attendance
  - e. Master data on students' grades
  - f. Master data on students graduation
  - g. Master data on students' status
- (b) Interview is a data collection method by direct conversation with individuals who could provide data related with the study.
- (c) Literature review; the researcher collected information from variety of sources in order to gain information related with the study such as from books, journals, proceedings, e-journals, e-books, and the internet.

### ***3.5 Analysis on the information needed by the business***

Results of analysis on the information needed by the business:

- a. Information on data of the number of new students every year, in order to evaluate the trend for each of the study program.

- b. Information on data of academic status of each student every semester to be evaluated for teaching and learning process at every semester.
- c. Information on the number of graduates from every study program in a certain period, that were classified based on the total study period and grades; the more students who graduated on time, the better the evaluation given for the study program.

### ***3.6 Planning and implementation of data warehouse***

This stage was started with designing a physical and logical architecture from the data warehouse. The data that were collected from various interfaces available in the storage of operational academic database and in sheet files were processed to be high quality information needed by the study. The method used to build the warehouse was performed in nine stages, known as the Nine-Step Methodology. The nine steps used in database planning for data warehouse were: [26]

- a. Process selection.
- b. Setting of the grain or the source of business process.
- c. Identification and adjustment of the dimension.
- d. Selection of facts.
- e. Storage of initial calculation in the fact table.
- f. Re-checking of the dimension table.
- g. Selecting the duration of the database.
- h. Tracking changes of the dimension.
- i. Selecting the priority and type of the query as well as the physical design.

### ***3.7 Drawing the conclusions and suggestions***

After data warehouse was developed, the next stage was to implement it based on the need of the university management. From the planning the implementation performed in this study, the final conclusion and suggestions were drawn from.

## **4. Results and Discussion**

### ***4.1 Data Warehouse Planning***

The process of data warehouse planning was a bottom-up process, with the steps:

#### **A. Choosing the process**

1. Analyzing the problems faced by PCR.
2. Analyzing and selecting the need for data and information.

Analysis to identify the need of the university in terms of academic information such as:

- a. Information on the number of students every year.
  - b. Information on students' grades from every batch/year.
  - c. Information on the number of graduates at every academic year, with the criteria:
    - The number of students who graduated on-time.
    - The number of students who graduated more than 4 years (D4) and 3 years (D3).
  - d. Information on the effect of student activities, curriculum, and research activities of the lecturers on students' grades.
3. Selecting the methodology for data warehouse planning.

The methodology used for the data warehouse planning was Kimball method known as the Nine-Step Methodology

4. Developing Fact Constellation.

After screening of the data collected for the planning of data warehouse was performed, the next process was to create dimensional table and fact table in the form of Fact Constellation. Below is the visualization of the Fact Constellation that was designed for the planning of the data warehouse:

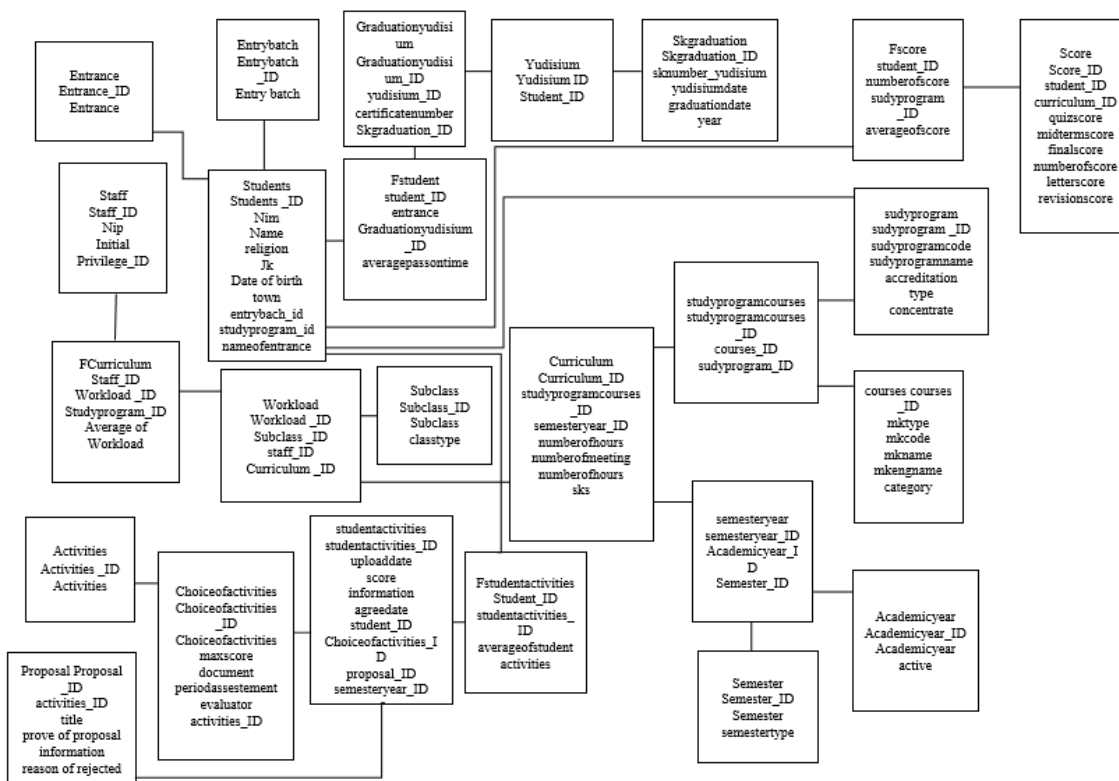


Figure 3 Fact Constellation

In Figure 3, it can be observed that Fact Constellation could connect with other tables leading to a dimension that resulted in a measure. In this study, there were 6 dimensions and 4 fact tables to create information needed by the academic system. The six dimensions were:

1. Research
2. Workload
3. Student
4. Graduation
5. Grade
6. Choice of activities

Meanwhile, the 4 fact tables developed in this study were:

1. Fstudents, which displayed the average number of students who graduated on time, the number of total graduates, and the number of students every year.

Student fact table has 2 dimension tables namely student table containing student data and graduation graduation table containing graduation data (graduation decision letter, graduation date and graduation date). The subjalur table (entry point), class and study program (study program) are related to student tables. This relation means that it can be interpreted that every generation, sub-team and study program has at least 1 student or a maximum of many students. Yudisiumwisuda table contains the number of graduation and graduation skills containing diploma numbers related to the judicial table containing student IDs that are graduated. This relation means that it can be interpreted every graduation program and judicium has each student who has graduated (labeled yudisium).

2. Staff activities, which displayed the average workload and the number of subjects handled by each lecturer/lab technician.

The fact table shows student activity 2 dimension tables, namely student activity table containing student activity choices and student submissions and tables containing student data. The sub-track table and the forces are related to student tables. This relation means that it can be interpreted that each force and sub-team has at least 1 student or a maximum of many students. The activity selection table contains any activities that can be carried out by the student and the lesson contains the date of submission and documentary evidence of the activity related to the activity table. This relation means that it can be interpreted every choice of activity and submission has students who have carried out activities.

3. Students' activities, which displayed the common activities joined by the students from each study program and the average grade of each activity.

The curriculum fact table contains 2 dimension tables, namely the employee table containing employee data and the loading table containing the loading hours, courses and semester. The table has a curriculum that has a relation with the study program course which contains a list of courses and Tasemester containing the semester and school year. The loading table has a relationship with a curriculum which means that each curriculum has a minimum of 1 load or a maximum of a lot of loading.

4. Fscore, which displayed the average grade per batch and the total number/hours of classes.

The fact table of student scores has 2 dimension tables, namely student table and student value table. The sub-track table and the forces are related to student tables. This relation means that it can be interpreted that each force and sub-team has at least 1 student or a maximum of many students. The table of values has a relation with the table has a curriculum which means that each value has at least 1 curriculum (subject) or a maximum of many curriculum (courses). The table has a curriculum that has a relation with the study program course which contains a list of courses and Tasemester containing the semester and school year.

**B. Choosing the grain.**

Grain is the database of facts that are going to be analyzed. Based on the business process, the grain was set and it displayed the fact table as follows:

- The average number of students who graduated on time and the number of graduates that were classified based on entry batch, graduation year, and study program.
- The number of students that were grouped based on entry system, gender, entry batch, and study program.
- The number of campus activities joined by the students based on entry batch, activity grades, and study program.
- The average grades that were sorted based on entry batch, lecturer/staff, and study program.

**C. Identification of adjustment of the dimensions.**

Design of the matrix for academic data warehouse of PCR was adjusted to the results of need analysis. The development of the data warehouse was based on:

Business process/dimension	Study program	Student	Staff/lecturer/lab technician	Time	Grade	Yudisium
Aware of the student's work achievement	✓	✓		✓	✓	✓
Aware of the lecturer/lab technician's work achievement	✓		✓	✓		
Aware of the effect of the learning curriculum	✓	✓		✓	✓	

Figure 4 Matrix for development of DW scheme

Identification of dimensions related to the fact tables was performed and the results helped to determine the dimensions involved in the study:

1. Workload
  2. Student
  3. Graduation
  4. Grade
  5. Choice\_of\_activity
- D. Choosing the facts.

Facts to be used in data mart were selected. Each fact contained quantitative data that could be later displayed in a report, graph, or diagram. Below are the facts available for the users:

- The average number of students who graduated on time and the number of total graduates that were sorted by student\_id, entry\_batch, graduation\_year, and study\_program.
- The number of students that were sorted by student\_id, name\_entry system, gender, entry\_batch, and study\_program.
- The number of student activities, sorted by student\_id, entry\_batch, activity\_grade, and study\_program.
- The average grades, sorted by student\_id, entry\_batch, initial, and study\_program.

- E. Storage of pre-calculation data in fact table.

In fact tables, there were data that were the results of pre-calculation, which were stored in fact tables. Total number of students was stored in new students' fact and total number of student activities was stored in new student activities fact.

- F. Rounding out the dimension tables.

Adding text description in dimension table. Description was prepared for the users.

1. Student Dimension
2. Course Dimension
3. Class Dimension
4. Study Program Dimension: Informatics engineering, computer engineering, information system, accounting, mechanical engineering, electronics engineering, electronics and telecommunications engineering and telecommunications engineering.
5. Activity Dimension: list of student activities to which load is to be given as a requirement for graduation or final assessment
6. Student Activity Dimension: students must upload documents proving their activities for assessors' approval and to be graded according to the type of the activities
7. Study Program Course Dimension
8. Grade Dimension
9. Employee Dimension
10. Load Dimension
11. Proposal Dimension: proposal of student activities submitted by students
12. Activity Selection Dimension: student activity assessment undertaken by several assessors according to the type of activity of each student
13. Curriculum Dimension
14. Semester Dimension
15. Decision Letter on Graduation Dimension: decision letter on graduation
16. Student Sub-Track Dimension: admission track to PCR (scholarships from institution, senior high school and vocational high school, scholarships from Inter High School Accounting Olympiad (IHSAO) organized by Student's Union (HIMA) of accounting, special *Penyaringan Siswa Unggulan Daerah* (PSUD), PSUD Goes to School (PSUD GTS), Writing examination I, writing examination II and Writing examination III).
17. Sub-class Dimension: class list of all study programs
18. Academic Year Dimension



19. Academic Year-Semester Dimension: academic year-semester relation
  20. Final Assessment Dimension
  21. Final Assessment-Graduation Dimension: final assessment-decision letter on graduation relation
- G. Selection of database duration.

Data that were managed in the data warehouse were the students' academic data from 2014 to 2017.

#### ***4.2 Implementation of data warehouse***

##### ***4.2.1 Implementation of pentaho tools***

The stages of extraction, transformation, and loading were performed as follows:

1. *Extraction*: In this step, the data was imported from spreadsheet file into mysql database.
  - Creating new database and tables using mysql.
  - Importing the available data into the new database.
2. *Transformation*: there were 3 steps performed in this process:
  - a. *Data selection*: Selecting data from extraction results (student, subject, batch, and grade).
  - b. *Data cleaning*: Noise was cleaned at this step by manipulating empty or incomplete data.
  - c. *Splitting/Joining*: At this step, manipulation and joining of data were performed based on the fact tables developed previously (example: merging/joining students table with subjects table or students table with grades table, etc.).
3. *Loading*: This process is the last stage in ETL. Cleaned data were stored in data warehouse. The output was in the form of transformed data from Pentaho that was stored in mysql database.

##### ***4.2.2 Implementation of tableau tools***

To observe the pattern of students dynamic, data could be visualized graphically using Tableau. Prior to visualization, scheme was developed based on fact constellation model.

After the scheme was developed, visualization was prepared and analyzed. Some information obtained was:

- **Information on number of students based on entry batch and entrance**

There were 4 tables involved in the dashboard: student dimension, entry batch and entrance; while measurement was done on the total number of students.

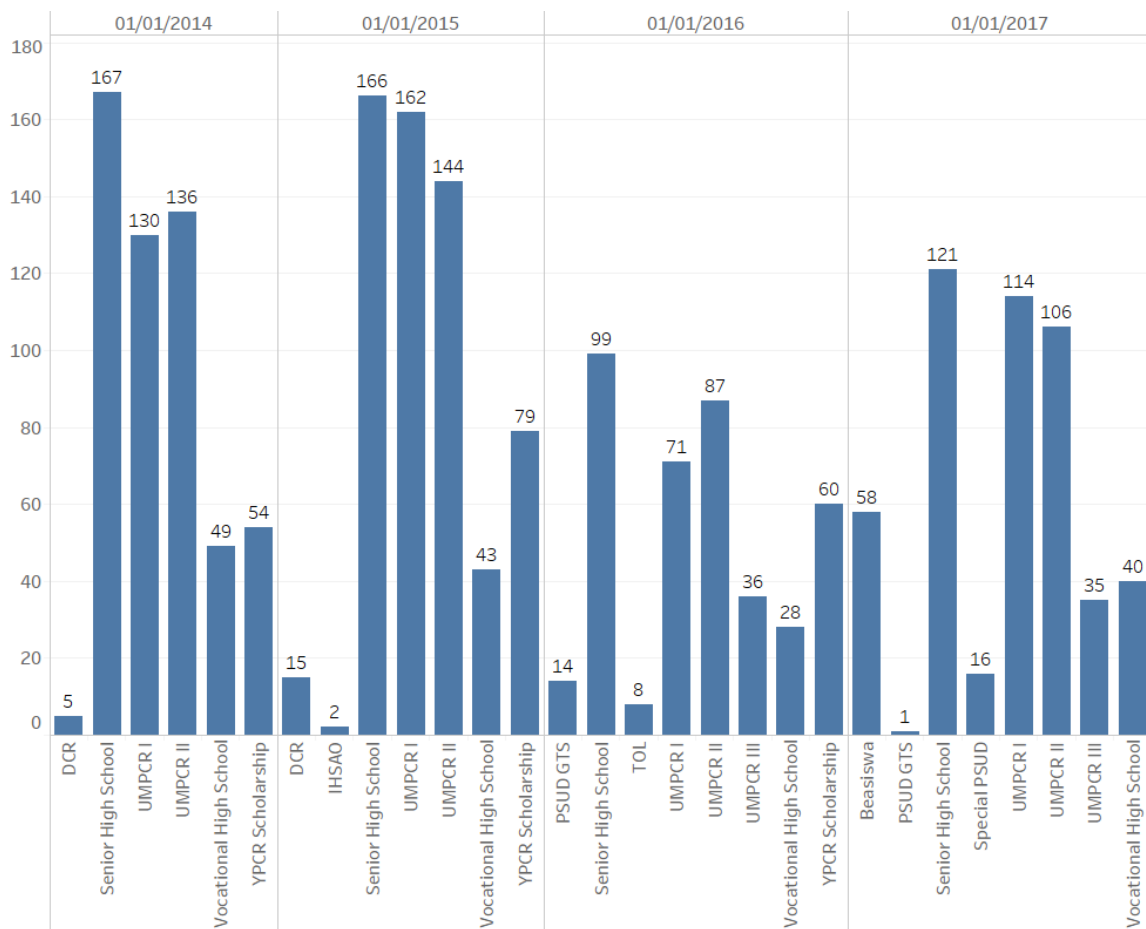


Figure 5 Total number of students based on entry batch and entry system

Based on the visualization, the number of students could be seen from the results of data analysis:

- Based on the entry batch: the number of students declined gradually.
- Based on the entry system: the number of students coming from Public Senior High school was always the highest.

▪ **Information on average grades for every entry batch based on study program and lecturer/staff involved**

There were 4 dimension tables contained in the dashboard: student, staff, study program, grade, and entry batch. Measurement was performed for average grades in every batch.

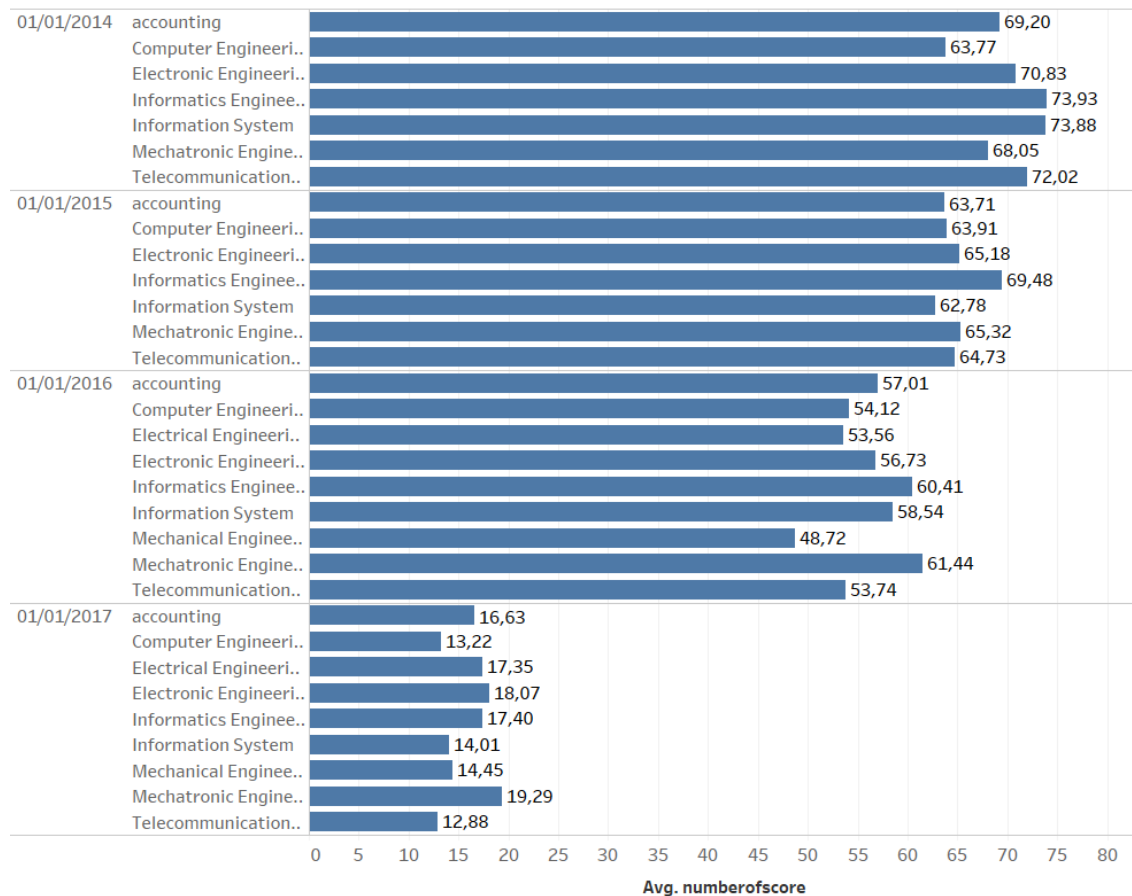


Figure 6 Average grades in every entry batch based on study program

Based on the visualized data, it could be observed that:

- Based on the subject: the highest average grade from batch 2014 to batch 2017 was in the study program of Information System and Information Engineering.

**Information on the average number of graduating students per class based on study program and sub-track**

On this dashboard, four tables are involved, namely the dimensions student, class, study program and sub-track. Meanwhile the measurement used includes the average number of graduating students per class.

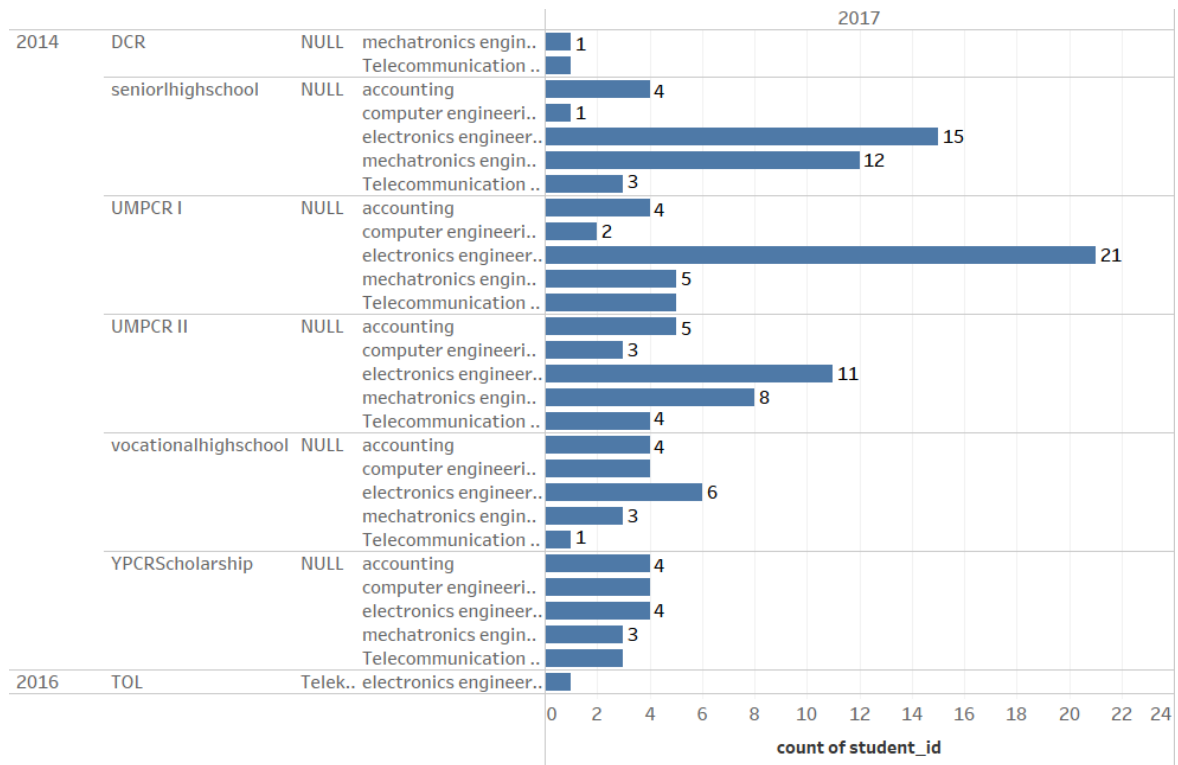


Figure 7 Average number of graduating students per class based on study program and sub-track

Based on the visualization above, the average number of graduating students can be identified from the data processed:

- In terms of sub-track: the average number of graduating students of class 2014 from Electronic Engineering study program and UMPCR 1 (graduating year 2017).

**Information on the average student activity grade per class based on study program**

On this dashboard, 4 tables are involved, namely the dimensions student, class, study program, activity and activity grade. Meanwhile the measurement used includes average student activity grade.

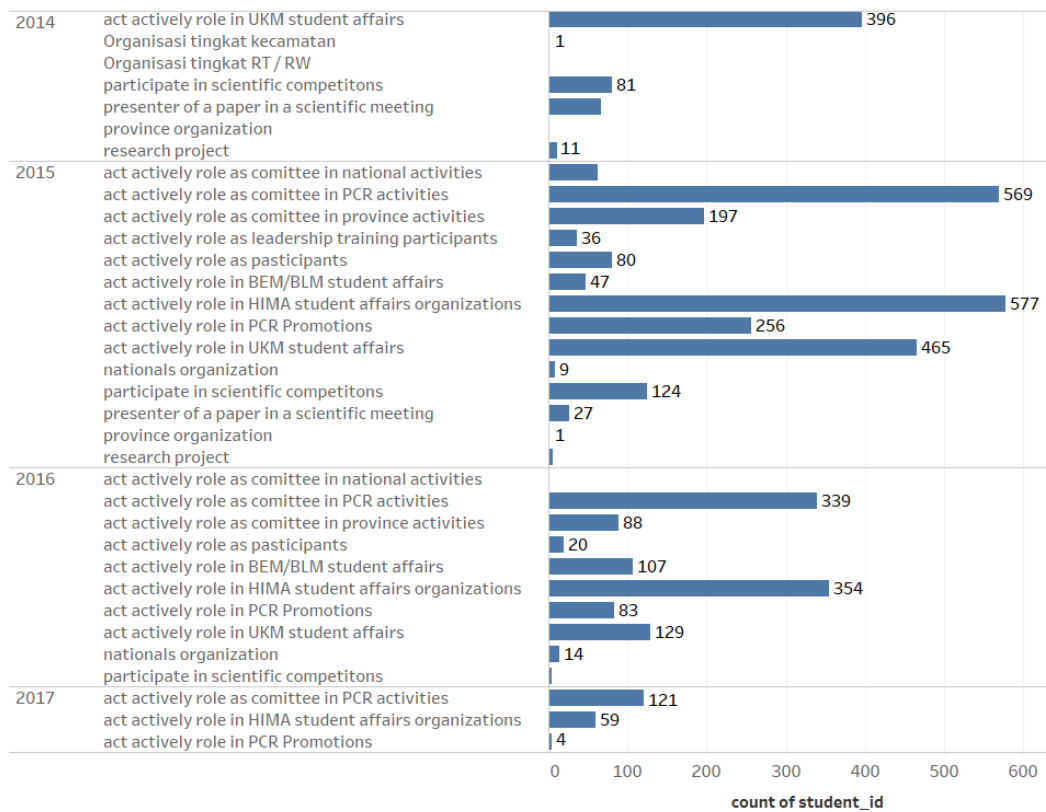


Figure 8 Average student activity grade per class based on study program

Based on the visualization above, the average student activity grade and average number of graduating students can be identified from the data processed:

- In terms of activity: the highest activity grade average is that of active participation as a committee member in a PCR- and HIMA-level activity.

**Information on grades and student activity**

There were 2 fact tables in the dashboard: student activities and f-grades. Meanwhile, measurement was conducted on average grades, and average activity grades for the students.

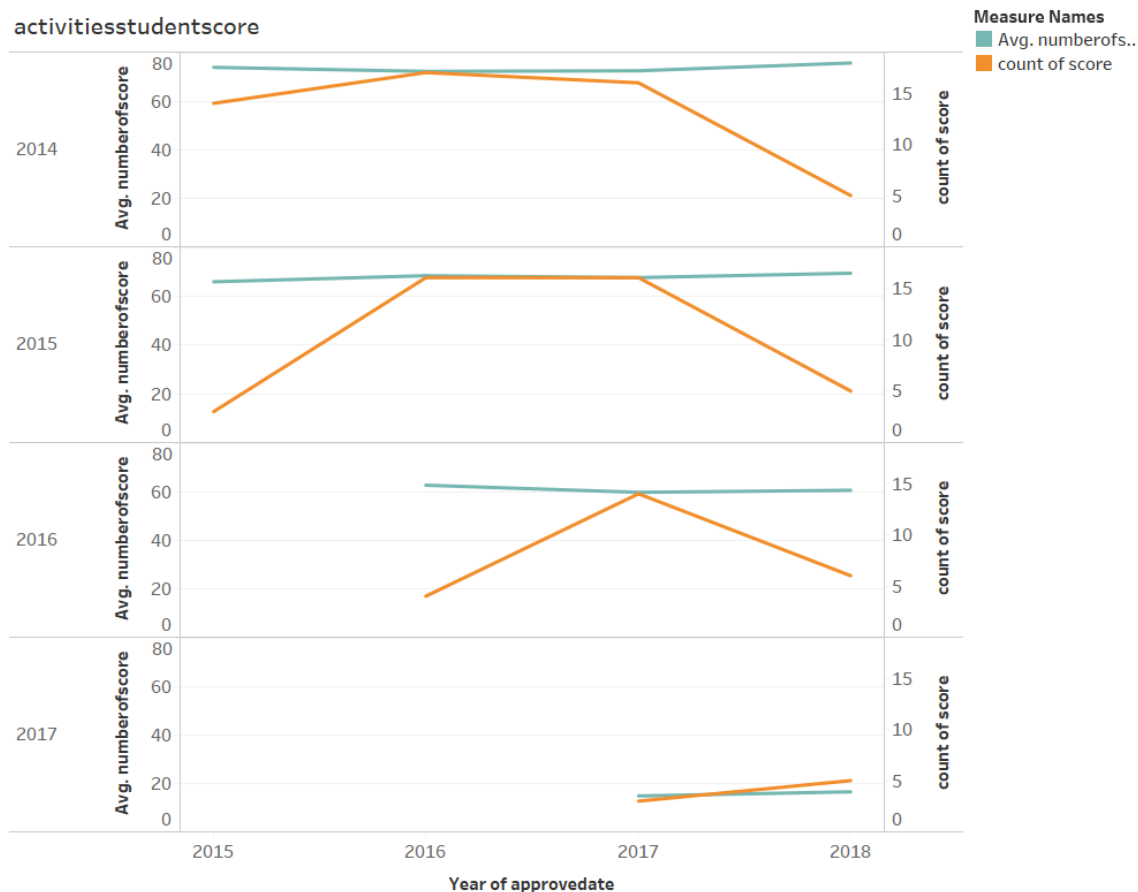


Figure 9 Information on grades and student activity

Based on the visualization, it could be observed that:

- Viewed from the above information that student activity is influential with the value of students. In the early years of college, students are busy a lot of activity so that its value slightly decreased, but in the final year they are more thinking about score than other activities.

## 5. Conclusions

The following are the conclusions of this research:

- Data integration process starts with extraction, followed by transformation for adjusting the data in the format suitable for analysis purpose. The data in the format suitable for evaluation and analysis purposes subsequently are stored in the Data Warehouse (loading). Data Warehouse in the Academic field consists of five dimension tables (Load dimension, Student dimension, Final Assessment/Graduation dimension, Grade dimension and Activity Selection dimension) and four fact tables, namely Student Fact, Load Fact, Student Activity Fact and Grade Fact.
- The information generated by the Data Warehouse designed can be used as the basis for the presentation of integrated data as supporting data in the process of evaluation in Academic field and as a rationale for management's decision-making process.

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# Uncharacteristic of Geomorphological Landscape & Depositional Environment in Talawi Hilir: Geotourism Value of Sawahlunto City, West Sumatra, Indonesia.

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**Abstract.** TalawiHilir Village, Talawi HilirSubdistrict, Sawahlunto City, West Sumatra Province is one of the areas that have interesting geological conditions to study. The objective of this research are interpret of some uncharacteristic include: geomorphologic processes, depositional environment and potentialgeotourism. The methods of study consist of geological data field collection and laboratory include: rock sample, collect data of strike/dip, contact between lithologies, structure of geology, geomorphological photo and map. The result of the analysis of geomorphological aspects of the study area was classified into four units: Alluvial Plain Fluvial Geomorphology Unit, High Hills Undulating Structural Geomorphology Unit, Steep Hills Structural Geomorphology Unit, Very Rough Mountains Denudation Geomorphology Unit. Petrological analysis classified into four units lithologies: Claystone Unit, Limestone Units, Sandstone Units and Breccia Unit. Claystone Unit as interprets in shallow marine depositional environments on the lower fan, which is characterized by the flow turbidite. Limestone Unit as interpret as depositional environments in shallow sea, the Sandstone Unit as interpret as lacustrine depositional environment and Breccia Unit as interpret as alluvial fan depositional environment. Geotourism potential particularly in geological variation, research area were unique characterization on landscape, landform, rock outcrop, rock unit, rock type, and minerals.

## 1. Introduction

The study area is located at 00 37 '00 "LU and 1000 46' 00" BT, which is included in the map of West Sumatra map scale 1: 12,500 with the area of the study 2.5 x 3 Km<sup>2</sup>. Talawi Hilir Village, Talawi Hilir Subdistrict, Sawahlunto City, West Sumatra Province is one of the areas that have interesting geological conditions to study, both from the aspects of geomorphology, petrology, stratigraphy, environment deposition and geotourism potential. In physiographic area of research into the basin zone Ombilin [1][2][3]. This research was conducted in the framework geological research, Ombilin Basin is a basin "pull apart" due to the movement of the Sumatra Fault System (Sumatra fault zone)[4][5][6]. Extends the overall geometry of the basin Ombilin with the general direction of Northwest - Southeast, bounded by faults trending Northwest-Southeast Fault Sitangkai in Northern and Southern Silungkang both more or less parallel to the Sumatra Fault System [7][8][9][10]. Ombilin Basin can be divided into some formations include of Brani Formation, Sangkarewang Formation, Ombilin Formation[11][12].

## 2. Method

Data collected and process in this research include of contour map or base map, rock sample, fossil content, and strike/dip. Method use in this research classified into three: Field orientation, laboratory and studio. The tools used for data collection in the field are: A contour map or basic map scale of 1: 12,500 map sheet Talawi Hilir. Geological hammer, hammer includes a hammer igneous and sedimentary rocks to take samples. Lup lens to observe mineral and fossil. Comparator grain size and

mineral. HCl with solution 0.1 N used to test the content of carbonate rock samples were observed. Measuring tape to perform measurements on outcrops.

The geomorphology is defined as a study that describes the shape of land and process and the relationship [13]. The landform and the process in the arrangement of spatial. The formation of the landscape is the result of the geomorphological process caused by the endogenous and exogenous forces. The landscape has varied shapes and can be classified based on certain factors such as process, phase, the type of composing lithology as well as the influence of geological or tectonic structures that work. The classification of landscapes (Table 1) and (Table 2) into geomorphological units based on several factors through five approaches are: Morphography is an aspect that describes the morphology of an area such as terrain, hills or mountains [14]. Morphometry is the value of an area geomorphology aspect, such as slope, elevation, slope length and roughness relief can be seen in Table 3. Passive morphostructure is the aspect that examines the lithology/rock type and rock structure associated with the erosion process, such as Cuesta, hogback and dome [15]. Active morphostructure is the aspect that examines the activity of endogenous processes such as vulcanism, fractures and creases, such as volcanoes, anticline mountains, fault slopes. Morphodynamics are aspects that describe exogenous processes associated with wind, water or ice motion, such as sand dune, fluvial plain, sedimentation or desert [1][16][17].

**Table 1.** Landscape Unit Classification Based on High

Relief Unit	Angle Slope (%)	High (m)
Flat or nearly flat	0-2	<5
Corrugated / sloping ramps	3- 7	5-50
Wavy	8 - 13	51-75
Hilly Wavy	14-20	76-200
Hilly sharp steep	21 -	55200-500
Mountains sharp cuts	55-140500	- 1000
Very steep	Mountains>140>	1000

**Table 2.** Classification of Landscape Unit

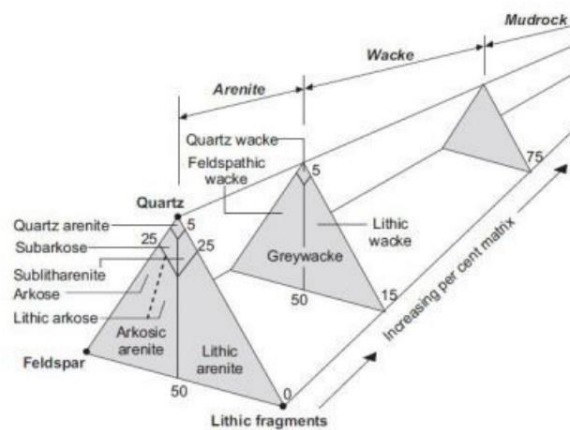
Landform	Symbol	Color
Structure Formation	S	Purple
Origin of volcano formation	V	Red
Denudation Formation	D	Coklat
Sea origin Formation	M	Biru Tua
river origin / fluvial Formation	F	Green
Wind Formation	A	Yellow
Karst Formation	K	Orange
Glacial Origin Formation	G	Blue Bright

**Table 3.** Classification Structural Landform

Geomorphologic alProcessess	Landform	Code	Structural Landform
Endogenous	Structural	S17	Valley Structural
Exogenous	Denudational	D1	Eroded Hills

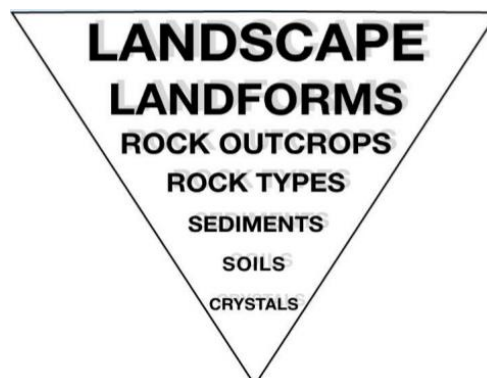
This lithology is used as controller in determining limit - geological units. Lithology may affect the morphology of rivers and topology networks that facilitate weathering and rock resistance to erosion. Petrography is an analysis of the composition of rocks using a microscope to determine the name of rocks more accurately for the purposes of determining the deposition environment based on the percentage of rock composition. In petrographic observations, we must be able to determine the amount of composition volumetrically to determine precisely the name and texture of the rock [1][18].

The basic used for the naming/classification of rocks is based on the composition of mineral constituents of rock and based on the texture of rocks. Both criteria are not only useful for the description (naming) of rocks but also for the origin of rock events. Calculation of percentage of mineral sedimentary rock composition can be seen in Figure 2 and Figure 3. Method of Rock Naming: Calculates the percentage of the presence of a major mineral, where the amount of Q + A + P + RF should be 100%. Q = Quartz, A = Alkali feldspar, P = Plagioclase, RF = Rock Fragment, show in Figure 1. If the number of primary mineral percentages is not 100% then the main mineral count is recalculated to 100%. Plot the percentage price of the main mineral into the diagram to get the name of the rock [1][19].



**Figure 1.** Classification of Sandstone according to Pettijohn (1975)

Geotourism is defined as tourism that sustains or enhances the distinctive geographical character of a place—its environment, heritage, aesthetics, culture, and the well-being of its residents [20][21][22][23][24][25][26][27]. Geological context used for geotourism evaluation consist of Landscape, Lanforms, Rock Outcrops, Rock Types, Sediment, Soils and Crystal, Show in Figure 2.



**Figure 2.** Geological context triangle used for geotourism evaluation

### 3. Result and Discussion

Result of study consist of 3 aspect, include of geomorphology, petrological and environment deposition, and geotourism potential.

### 3.1 Geomorphology

The characteristic of geomorphology unit of research area classified into four: Alluvial Plain Geomorphology Unit, High Hills Undulating Geomorphology Unit, Steep Hills Geomorphology Unit, Mountains Very Rough Geomorphology Unit, Show in Table 4.

**Table 4. Geomorphology unit of research area**

Geomorphology Units	Form of Origin	Code	Morphology		Morphogenesis	
			Morphometry	Morphography	Lithologi	Morphodynamic
Alluvial Plain Fluvial Geomorphology Unit	Fluvial	F1	Slope percentage 0-2%	Plain	Breccia, Sandstone.	Agradation/ Progradation
High Hills Undulating Structural Geomorphology Unit	Structural	S12	Slope percentage 2-7%	Undulating	Sandstone, Silt, Breccia.	Erosion, Weathering, Endogenic.
Steep Hills Structural Geomorphology Unit		S4	Slope percentage 7-30%	Steep	Sandstone, Siltstone	
Very Rough Mountains Denudational Geomorphology Unit	Denudation	D10	Slope percentage >30%	Very Rough Mountain	Claystone, Siltstone, Breccia, Crystalline limestone.	Erosion Weathering

#### a. Alluvial Plain Fluvial Geomorphology Units

This unit coverage is around 25% of the area of research that has lithology breccias and sandstones. With the percentage of slope of 0% - 2%, show in Figure 3.



Figure 3. Alluvial Plain Fluvial Geomorphology Units

#### b. High Hills Undulating Structural Geomorphology Unit

This unit coverage is around 65% of the study area, with the percentage of slope 7% - 15%. Geomorphological unit is composed of lithology such as sandstone, silt, and breccia, show in Figure 4.

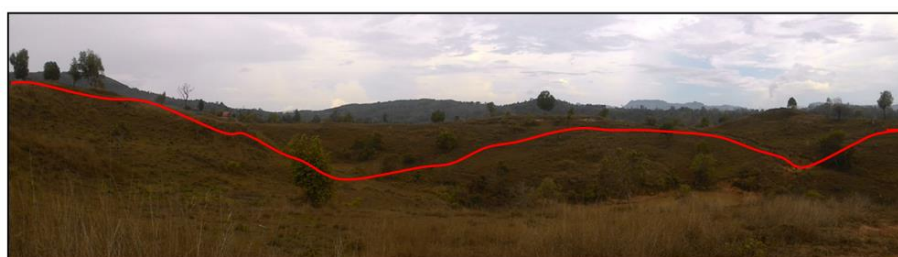


Figure 4. High Hills Undulating Structural Geomorphology Unit

c. Steep Hills Structural Geomorphology Unit

This unit coverage is around 15% of the study area with the percentage slope of 15% - 30% composed were sandstone and siltstone lithology, show in Figure 5.



Figure 5. Steep Hill Structural Geomorphology Unit

d. Very Rough Mountains Denudation Geomorphology Unit

This unit coverage is around 5% of the study area with the percentage slope of 70% - 140% composed of sandstone lithology. The characteristic of lithology unit of research area classified into four consist of: Claystone Unit, Sandstone Unit, Breccia Unit, and Crystalline Limestone Unit, show in Figure 6.





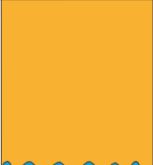

Figure 6. Very Rough Mountains Geomorphology Unit

3.2 Petrological and Depositional Environment

Petrology analysis uses several parameters to analyze rock lithology, namely, colors consisting of fresh colors and colors, texture consisting of large, grain shape, container, sorting, permeability, hardness, sedimentary structure, carbonate content, mineral composition, hardness and contact. Stone units in the study area are four: Claystone Unit, Sandstone Unit, Breccia Unit, and Crystalline Limestone Unit. Claystone unit has depositional environment in turbidite flow area, Sandstone U nit in lacustrine area, Breccia Unit in lower part of alluvial fan and Crystalline Limestone Unit in shallow marine, show in Table 5.



Table 5. Stratigraphic column of study area

Age	Formation	Litology Unit	The continuity of regional stratigraphic relationships	Depositional Environment
Early Miocene	Lower Member of Ombilin	Claystone		Turbidite flow
Oligocene				
Eocen				
	Sangkarewang	Sandstone		Lacustrine
Paleocen	Brani	Breccia		Lower part of alluvial fan
Pre-Tertier	Silungkang	Crystalline Limestone		Shallow marine

a. Claystone Unit

Claystone in the research area shows characteristics weathered colour is greenish brown and fresh colour is brown, grain size  $<1/256$  mm, grain shape is rounded, well sorted, permeability being shown with absorption fast enough when drops of water, can be soft squeeze, show in Figure 7. Spreading widely available in the northern part of the study area. Characteristic of depositional environment of this lithology unit is interpret in the lower part of the fan, which is characterized by the existence of the turbidite flows.



Figure 7. Photo geology show claystone outcrop

b. Sandstone Unit

Sandstones in the research area shows the characteristics weathered colour is grayish yellow, fresh colour is gray, grain size from 0.125 to 0.25 mm were classified as a fine sandstone, grain shape is very

rounded, very well sorted with a uniform grain size, poor permeability sandstone indicated by the length of absorbing when drops of water, hardness is very compact, show in Figure 8. Sandstone in research area classified as a arkose sandstone with percentage of 55% quartz, 40% feldspar, 5% rock fragments. Characteristic of depositional environment of this lithology unit is interpret in lacustrine area.



Figure 8. Photo geology show sandstone outcrop

#### c. Breccia Unit

Breccia in the area of research show characteristics of weathered colour is brownish gray whereas the fresh color dark gray, size of fragments is 64-256 mm classified as a cobble, roundness of grain is very angular, low permeability indicated by the grain size is not uniform, and very compact, show in Figure 9. This classified as polyimic breccia with fragments type consist of igneous and sedimentary rocks. Spreading widely available in the west to the east area of research. Characteristic of depositional environment of this lithology unit is interpret in lower part of alluvial fan area.



Figure 9. Photo geology show breccia Outcrop

#### d. Crystalline Limestone Unit

Limestone in the research area shows the characteristics weathered colour is Grayish white whereas fresh colors is white, irregular sides of the field, the pieces show the surface area of the rugged, compact hardness, carbonated consists of 99% crystallize calcite, show in Figure 10. Characteristic of depositional environment of this lithology unit is interpret in shallow marine. Depositional environment of research area was show in Fig11.

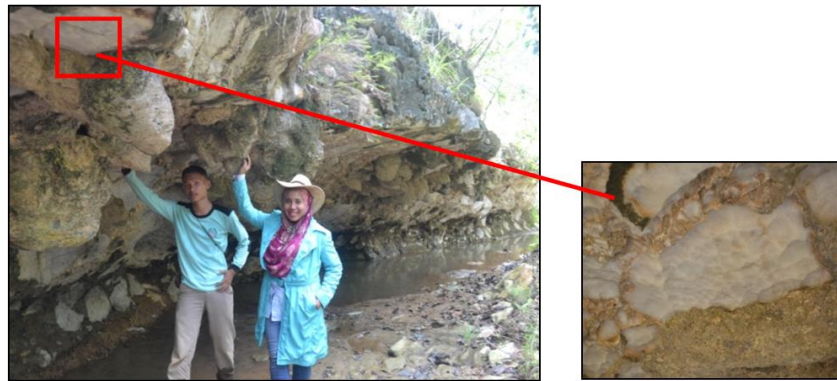


Figure 10. Crystalline limestone outcrop

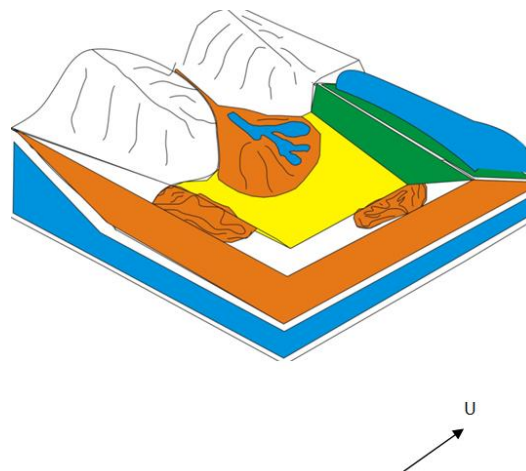


Figure 11. Depositional environment illustration of study area .

### 3.3 Geotourism Potential

Based on geotourism potential particularly in geological variation, research area have unique characterization on landscape (consists of Alluvial Plain Fluvial Geomorphology Unit, High Hill Undulating Structural Geomorphology Unit, Steep Hill Structural Geomorphology Unit, Very Rough Mountain Denudation), landform (consists of Alluvial, High Hill Steep Hill, Mountain), rock outcrop (clearly seen some of outcrop such as Claystone outcrop, Sandstone outcrop, Breccia outcrop, Crystalline Limestone outcrop), rock unit (consist of Claystone Unit, Sandstone Unit, Breccia Unit, and Crystalline Limestone Unit), rock type (consist of claystone, sandstone, breccia, and crystalline limestone) and mineral composition (observed by naked eye consist of quartz, feldspar, rock fragment and calcite), show in triangle Figure 12.

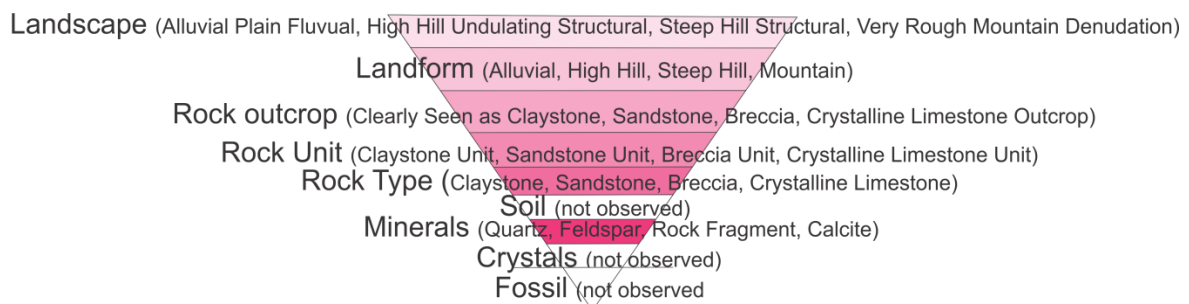


Figure 12. Triangle geotourism potential particularly in geological variation in study area



#### 4. Conclusion

Unicharacteristic of Talawi Hilir consist of lithology, depositional environment geomorphology have particular apart. The characteristic of geomorphology unit classified into four: Alluvial Plain Fluvial Geomorphology Unit, High Hills Undulating Structural Geomorphology Unit, Steep Hills Structural Geomorphology Unit, and Very Rough Mountains Denudation Geomorphology Unit. This unicharacteristic contributes to the potential value of geotourism in the research area. The characteristic of lithology unit classified into four consist of: Claystone Unit, Sandstone Unit, Breccia Unit, and Crystalline Limestone Unit. Depositional environment interpret from alluvial fan, lacustrine until shallow marine. Based on geotourism potential particularly in geological variation, research area were unique characterization on landscape, landform, rock outcrop, rock unit, rock type, and minerals.

#### 5. Acknowledgments

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# Prediction of Autoimmune Disease Using Backpropagation Method

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**Abstract.** Autoimmune disease is a generally disease caused by immune system disorders or protection in the body. The disease is not contagious, but it can be deadly. The problems of autoimmune disease are unhealthy life styles and unhealthy foods. The purpose of this study is to predict the symptoms of autoimmune diseases, for the prediction process how many people affected by autoimmune disease. The data used in this study is primary data and 50 consisted of. Backpropagation method is selected because it is good method and has small error rate of 0.5%. In this experiment are used 24 variables, with performance measurement in terms of accuracy and error rate.

## 1. Introduction

The higher the level of activity of the person, the weakening of the immune system in the body. This causes the body's immune system to decrease, and causes the body to get sick quickly. Immune reactions are systemic and can cause death [1]. Autoimmune diseases occur when anti-body (lymphocytes) weaken so that the disease easily enters the body. Problems that often arise in civil society often forget about health and are more inclined to unhealthy lifestyles and consuming unhealthy foods.

More than 80 autoimmune diseases have been identified. Some are relatively well known, such as type 1 diabetes multiple sclerosis, lupus, and rheumatoid arthritis, while others are rare difficult to diagnose[2].

One autoimmune disease that causes death is lupus. Based on online hospital information system (SIRS) data, in 2016 there were 858 hospitals reporting their data. It is known that there are 2,166 inpatients diagnosed with lupus, with 550 of them dying. The number of lupus cases in 2016 nearly doubled compared to 2014, which was 1,169 cases. The number of deaths due to lupus in hospitalized patients also increased significantly compared to 2014. The number of patients dying from lupus in 2015 (110 deaths) decreased compared to 2014. But this number increased dramatically in 2016, which was 550 deaths. The high mortality due to lupus needs special attention because around 25% of patients in Indonesia hospital in 2016 ended in death[ 3]

Based on this problem, it is necessary to apply backpropagation method based on artificial neural networks in predicting autoimmune diseases in humans. Backpropagation method has been widely used in solving problems, especially in the health sector. Tanjung's previous researcher, said that the backpropagation method can predict asthma by obtaining almost 100% test results by trial and error 0.001 with simoid activation function [4].

## 2. Research Methods

### 2.1 Dedicated and define the problem

The problem raised in this study is the prediction of autoimmune disease in humans with the symptoms given. Autoimmune disease is a non-contagious disease but a deadly disease. For that must be wary.

### 2.2 Determining research outcomes

The achievement of this research is a decision whether human have an autoimmune disease or not, to determine the outcome of the study this required determination of input and process variables that will be done. For input variables there are 24 input variables: pain in joints and muscles, weakness in muscle, easy to get disease, not cold weather or sensitive to hot weather, skin allergy, prolonged fatigue, insomnia, low fever, night sweats, martial arts, dry eyes, shortness of breath, back pain and sinking, unnatural heartbeat, dizziness, depression, difficulty concentrating and disrupted memory, swelling on the legs, ankles and faces. After the variable is determined for the process we do the calculation with backpropagation.

### 2.3 Determining the process of study literature

There are two stages in the study literature:

#### 1. State Of The Art

State Of The Art we use to see previous research with different methods, on the same topic, by looking for weaknesses or advantages of the calculation methodology presented.

#### 2. Study literature

We use it as the basis or theoretical foundation that supports the achievement of this research.

### 2.4 Collecting research data

Questioner deals with the questionnaire that we give to the community, in terms of what's lasting for several weeks. In the questioner we give skala 1-3, 3 = yes, 2 = maybe 1 = not as a benchmark whether society is indicated Autoimun disease. The media we use is Google Form as shown below

Fig. 1. Google Form

The following 24 questions are included in the Questioner

No	QUESTION
1	Have you experienced pain or pain in your joints for a few days?
2	Have you experienced weak muscles for a few days?
3	Are you easy to get an attack for some days?
4	Are you not resistant to cold weather or sensitive to hot weather?
5	Do you have skin allergies
6	Do you feel prolonged fatigue?

- 7 Do you feel insomnia?
  - 8 Do you feel unwell like a mild fever?
  - 9 Do you often sweat at night?  
Do you experience numbness in your hands for a few days and
  - 10 legs?  
Are you visiting the doctor and checking your blood pressure? Is
  - 11 your mother's blood pressure low?  
Do you experience (tremor) or vibration or shivering that occurs
  - 12 unconsciously?
  - 13 Do you often experience dry eyes?  
Do you or your mother experience a drastic loss or weight loss in
  - 14 the past few months?
  - 15 Did you experience hair loss?
  - 16 Do you experience dry mouth?
  - 17 Do you feel a short breath?
  - 18 Do you feel pain and sinking in your back?
  - 19 Do you feel that your heart is beating unnaturally?
  - 20 Do you feel prolonged dizziness?
  - 21 Do you feel the Depression?
  - 22 Are you difficult to concentrate and memory is disturbed?
  - 23 Do you experience swelling in your legs?
  - 24 Do you experience swelling of your ankles and face?
- 

### *2.5 Performing Artificial Neural Network Pattern*

The design of artificial neural network pattern is done to get the hidden input pattern and output that we will do before doing the calculation process. In this study there are 8 inputs divided by 2, ie 4 training 4 test of the sample, which represented 24 variables supporting questions on input, 3 hidden value and 1 Output value.

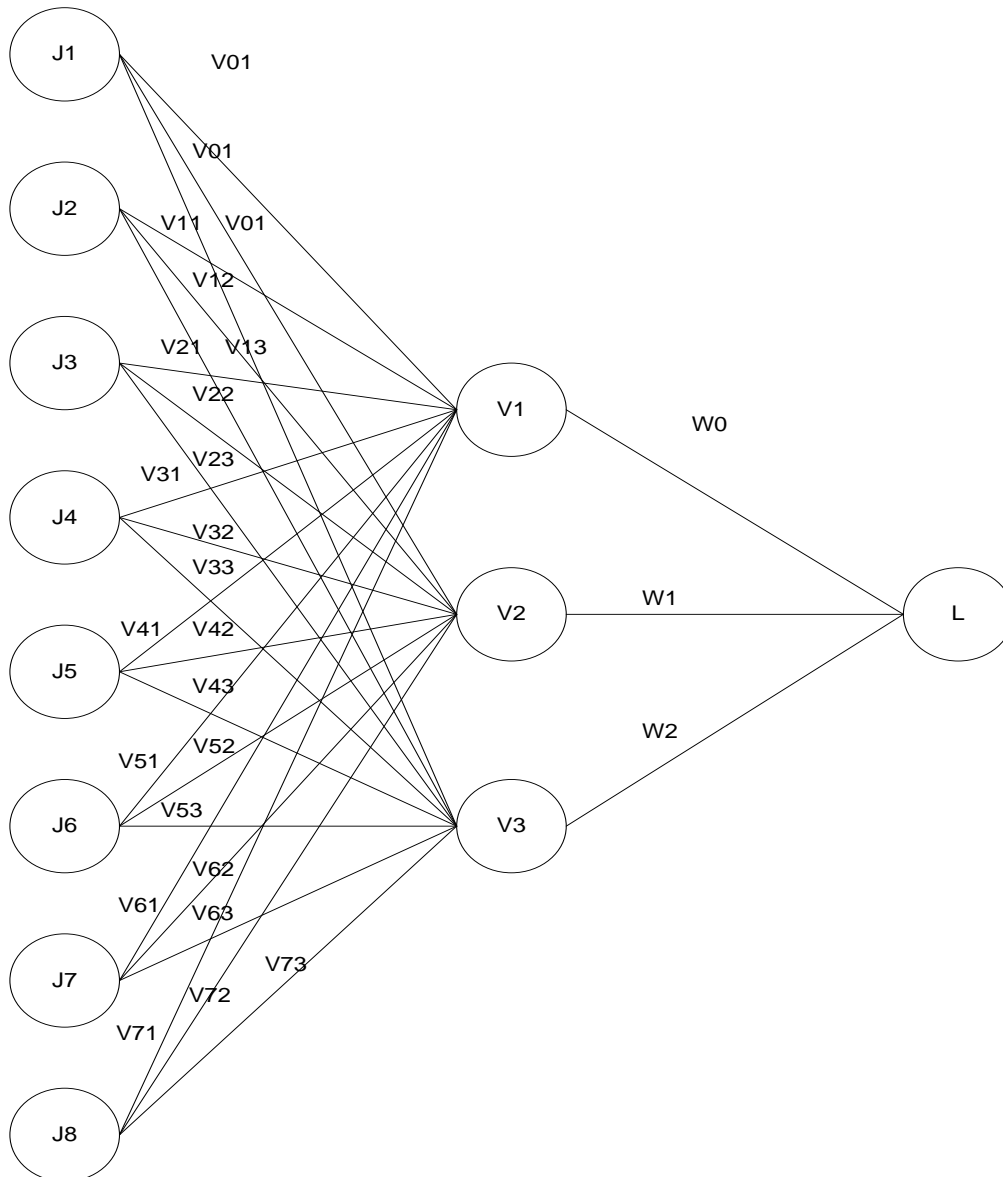


Fig. 2. Patern JST

### 2.6 Train and test using the Backpropagation Method

Train and test the results on backpropagation method this is done in order to get maximal results. The backpropagation method is equipped with 3 phases. Namely the forward phase, the reverse phase and the phase change value of the weight and the phase bias it has

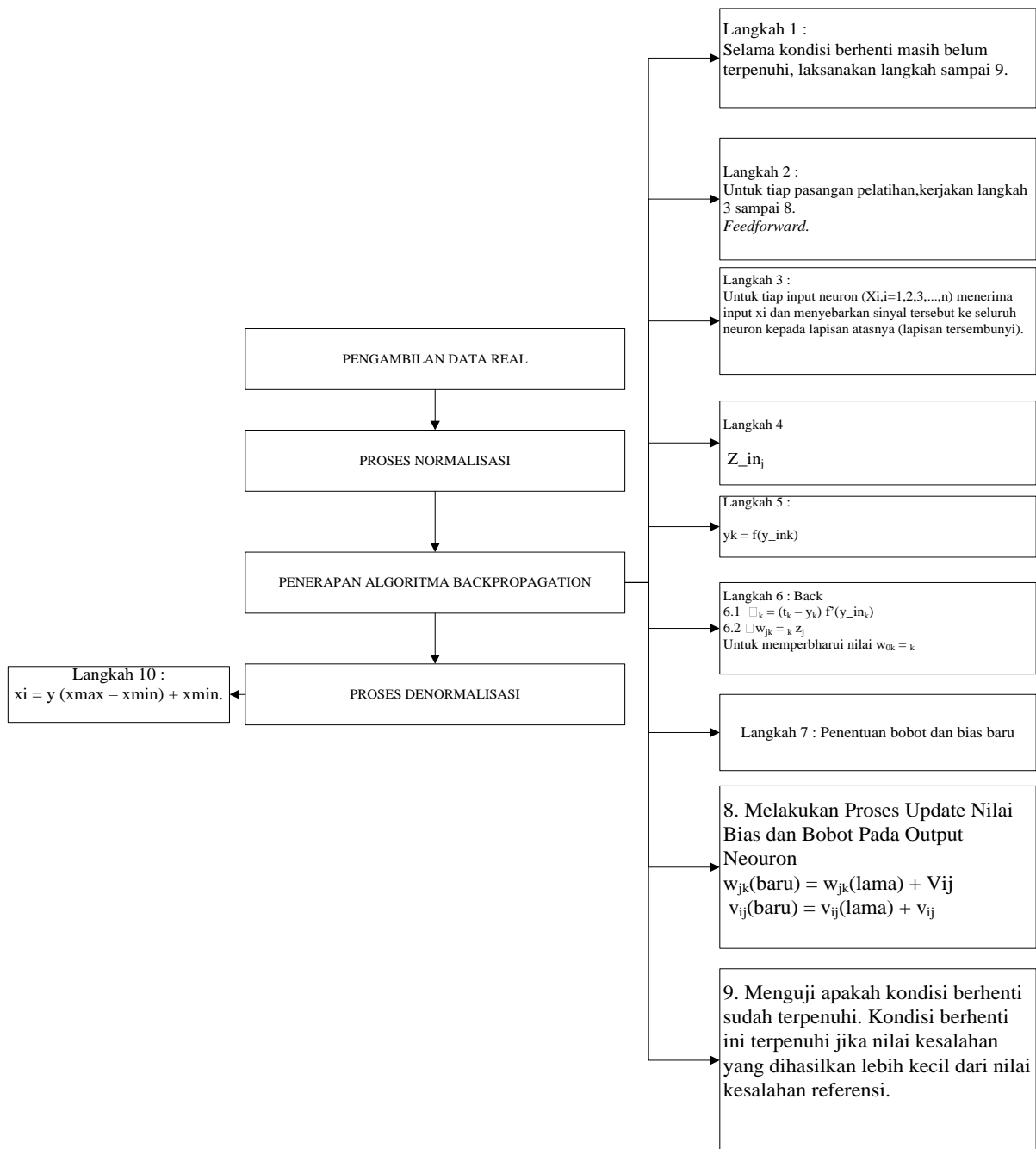


Fig. 3. Work Process Algorithm backpropagation

### 2.7 Evaluating Results obtained from the method used

Evaluation process is considered important, to determine the feasibility of the resulting output, is in accordance with the variable and process algorithm.

### III. Results and Discussion

First Questioner Value before we recap first and do the normalization process. This is useful as a reference to enter the value of the figure in the input JST as shown below:

TABLE 1. Recap Sample Value

PERTANYAAN	JAWABAN SAMPEL							
	1	2	3	4	5	6	7	8
1	1	3	1	1	1	1	1	1
2	3	3	1	1	1	1	1	2
3	1	3	1	2	1	3	3	3
4	1	3	1	1	1	1	1	1
5	2	3	1	1	1	2	1	2
6	1	2	1	1	1	1	1	1
7	1	1	1	3	1	1	1	1
8	1	3	1	1	1	1	1	1
9	1	1	3	3	1	1	1	1
10	1	3	1	1	1	1	1	2
11	1	3	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1
13	3	3	1	1	1	1	1	1
14	1	3	1	2	1	1	1	1
15	1	3	1	2	3	3	3	3
16	1	1	1	1	1	1	1	1
17	1	1	1	1	1	1	1	1
18	1	3	1	1	1	1	1	1
19	1	2	1	1	1	1	1	1
20	1	2	1	1	1	1	1	1
21	1	3	1	1	1	1	1	1
22	1	3	1	1	1	1	1	1
23	1	1	1	1	1	1	1	1
24	2	1	1	1	1	1	1	1
X	1,2500	2,2917	1,0833	1,2917	1,0833	1,2083	1,1667	1,2917
<b>NORMALISASI</b>	0,2104	0,9000	0,1000	0,2379	0,1000	0,1828	0,1552	0,2379
<b>NIL MIN</b>								1,0833
<b>NIL MAX</b>								2,2917

TABLE 2. Recap Sample Value

NORMALISASI	0.2104	0.9000	0.1000	0.2379
	0.1000	0.1828	0.1552	0.2379

Table 3. Normalisation data

J1	J2	J3	J4
0.2104	0.9000	0.1000	0.2379
J5	J6	J7	J8
0.1000	0.1828	0.1552	0.2379

For the training table used to train the data obtained on the backpropagation method that is in the pattern 1-4 and the test on pila 5-8. For training input value we use J1-J4 from pattern 1-4. The target



value we use on the 1-5 pattern. As for test value we use pattern 5-8 with input J5-J8 and target value used Pla 5-8. As shown in table 4 and table 5 below:

TABLE 4. Training Autoimun

	J1	J2	J3	J4	TARGET
<b>POLA 1</b>	0.2104	0.9000	0.1000	0.2379	0.1000
<b>POLA 2</b>	0.9000	0.1000	0.2379	0.1000	0.1828
<b>POLA 3</b>	0.1000	0.2379	0.1000	0.1828	0.1552
<b>POLA 4</b>	0.2379	0.1000	0.1828	0.1552	0.2379

TABLE 5. Testing Aoutoimun

	J5	J6	J7	J8	TARGET
<b>POLA 5</b>	0.1000	0.1828	0.1552	0.2379	0.2104
<b>POLA 6</b>	0.1828	0.1552	0.2379	0.2104	0.9000
<b>POLA 7</b>	0.1552	0.2379	0.2104	0.9000	0.1000
<b>POLA 8</b>	0.2379	0.2104	0.9000	0.1000	0.2379

After that we continue the search process using the Backpropagation Method, and generate the Epoch and error values as shown below:

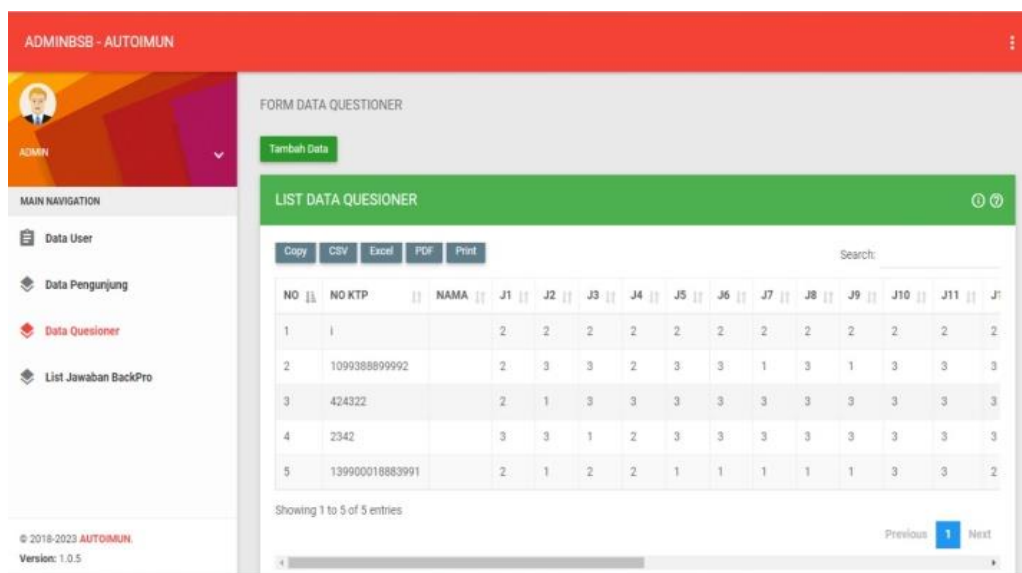


Fig. 4. Question data input

Normalisasi

NO	NO KTP	NAMA	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14	J15	J16	J17	J18	J19	J20	J21	J22	J23	J24	X	TOTAL X	NORMALISASI	
1	i		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	46	1.92	0.17
2	1099388899992		2	3	3	2	3	3	1	3	1	3	3	3	2	3	3	3	1	3	3	1	3	1	3	3	3	58	2.42	0.51
3	424322		2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	66	2.75	0.9
4	2342		3	3	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	66	2.75	0.9
5	139900018883991		2	1	2	2	1	1	1	1	1	3	3	2	2	1	3	1	3	3	1	3	3	1	3	1	44	1.83	0.1	

#	error(trainingdata)	error(controidata)	slope(error(controidata))
0	0.46871853767233	1	0
1	0.49263432754044	1	0
2	0.47321451158009	1	0
3	0.49089668716171	1	0
4	0.57388250445328	1	0
5	0.53238748794675	1	0
6	0.45971376497916	1	0
7	0.45783908504864	1	0
8	0.4603168313999	1	0
9	0.44714366296618	1	0
10	0.44562611634638	1	0
11	0.44111545163307	1	0
12	0.43720520814152	1	0
13	0.48215294226429	1	0
14	0.44303873349464	1	0

Fig. 5. Normalization

211	0.54880987330967	1	0
212	0.32610713788971	1	0
213	0.34561045699341	1	0
214	0.31962630925844	1	0
215	0.38458573255621	1	0
216	0.37072866897156	1	0
217	0.34285430917252	1	0
218	0.30418182839478	1	0
219	0.30997784217442	1	0
220	0.3187798693402	1	0
221	0.35187606774034	1	0
222	0.32205055647145	1	0
223	0.35379599080585	1	0
224	0.49023796211782	1	0
225	0.36253659502547	1	0
226	0.29732029240014	1	0

Training data Success pada epochs ke 227 !

No	Testset	Traget	Neural Network
1	Testset 0	Tidak Sakit [0]	0.035297936615992
2	Testset 1	Tidak Sakit [0]	0.5399592251439
3	Testset 2	Sakit [1]	0.7310112026907
4	Testset 3	Sakit [1]	0.7310112026907
5	Testset 4	Tidak Sakit [0]	-0.06696959057187

Fig. 6. Results

4. Conclusions and Recommendations

4.1 Conclusions

Backpropagation method for determining autoimun disease was successfully applied in this study with error value -0.0564 and has epoch 15. It can be predicted from the eight samples there is a decision there is 1 sample that suffer from autoimun and there are 7 who do not.

4.2 Suggestions

For further research to be developed more towards the program more structured and developed again pattern Artificial Neural Network.

Rererence

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## Effect of Casting and Mould Cooling Temperatures on the Warping Phenomenon of Aluminium at High Pressure Die-Casting

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**Abstract.** The effect of molten aluminium pouring temperature and hot oil temperature for mould heating and cooling on the warping phenomenon of thick-thin section aluminium high-pressure die-casting process was investigated on a four cavities hard disk drive mould. Nine combinations of molten aluminium A380 pouring temperature of 660°C, 690°C and 720°C and hot oil temperature of 150°C, 200°C and 250°C were being studied. Magmasoft simulation software was used to simulate the molten aluminium flow in the mould and distortion to understand the die-casting cooling pattern in response to different molten aluminium temperature and mould cooling parameters settings. Actual casting was carried out to produce the parts according to simulation settings. Warping data was collected and analysed using Minitab 17. It was found that each mould cavity had different cooling pattern resulting in different warping magnitude. Pouring temperature at 660°C and 720°C both had higher warping distortion than 690°C. Hot oil temperature at 150°C had higher warping distortion than 200°C and 250°C. The lowest warping distortion was establish at molten aluminium pouring and hot oil temperature of 690°C and 200°C respectively.

# Determination of Total Phenolic, Flavonoid Content And free Radical Scavenging Activity of Etanol Extract Sawo Stem Bark (*Manilkara Zapota* (L.))

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**Abstract.** Sawo (*Manilkara zapota* (L.) van Royen) was a plant used traditionally by the community to treat various diseases. The purpose of this study was to determine the content of total phenols, flavonoids and the activity of free radical scavenging ethanol extract of the stem bark of *M. zapota* (L.) van Royen. The stem bark extraction sample was carried out by maceration method using ethanol. Test of total phenol and flavonoids content using the Folin-Ciocalteu method, free radical scavenging activity using DPPH (2,2-diphenyl-1-picryl-hydrazil) method. From the phytochemical test results showed that positive extracts contain phenolic and flavonoid. The results showed that the yield of stem bark ethanol extract was 25.11% with a total phenolic content was 12.97 mgGAE/g extract. Total flavonoid levels was 8.75 mgQE/g extract. The activity of free radical scavenging extract (IC<sub>50</sub>) values of 19.69 ppm.

## 1. Introduction

Sawo (*Manilkara zapota* (L.) van Royen) is a plant that bears fruit throughout the year and spreads widely in Indonesia. Sawo is included in the family tree of Sapotaceae. It is one of the plants that is widely used in traditional medicine, including decoction of skin and fruit used for fever and diarrhea, and bark tea used for dysentery [1,2].

Sawo can provide pharmacological effects due to the content of active metabolites contained in this plant. The active metabolite compounds contained in sawo are alkaloids, flavonoids, tannins, triterpenoids, saponins and glycosides [1]. The results of previous studies stated that sawo leaves and bark also contained active metabolites, namely alkaloids, flavonoids, phenolics and saponins [3,4].

Several studies on *M. zapota* (L.) Van Royen have been carried out, including: ethanol bark of brown bark has antibacterial activity against *S. epidermidis* and *K. pneumonia* [4]. Also, fruit juice (sawo juice) can inhibit the growth of *S. typhosa* bacteria [5]. Furthermore, ethanol extracts of young sawo fruit are active against *E. coli* bacteria [6].

Some phenolic compounds have been isolated from this plant, including myricetin-3-O- $\alpha$ -L-rhaminopyranoside, Apigenin-7-O- $\alpha$ -L-rhaminopyranoside, and Caffeic acid, which are found in leaves and manilkorasid (saponin compounds) isolated from brown bark [7].

Phenolic compounds are natural ingredients that are widely used today. Their ability as an active biological compound provides a great role for human life. One of them is as an antioxidant for prevention and treatment of degenerative diseases, cancer, premature aging and disruption of the body's immune system [8].

Flavonoids are almost present in all parts of the plant including the fruit, roots, leaves and outer skin of the stem [9]. A number of medicinal plants containing flavonoids have been reported to have antioxidant, antibacterial, antiviral, anti-allergic, and anticancer activities [10].

Given the importance of the function of phenolic compounds and flavonoids, the purpose of this study was to determine the total phenolic and flavonoid levels contained in the plants of *M. zapota* (L.) Van Royen and the effect on free radical scavenging activity. Thus, the utilization of plants *M. zapota* (L.) Van Royen can be maximized to be used as an alternative herbal treatment in healing various diseases and their use can be accounted for by the community.

## 2. Research Methodology

This research was carried out for  $\pm 6$  (six) months at the Chemistry Laboratory of Universitas Muhammadiyah Riau, Pekanbaru.

### 2.1 Tools and Materials Used

The tools used in this experiment were rotary evaporator, analytic scale, knife, cutting board, glass bottle, parchment paper, autoclave, microplate reader, micro pipette, drop pipette, water bath, UV-Vis spectrophotometer, cloth, tissue and other glass tools.

The ingredients used were sawo bark (*Manilkara zapota* (L.) van Royen), ethanol 96%, DPPH 80 $\mu$ g / ml solution, ABTS solution, gallic acid, Folin-Ciocalteu 0.25 N, 7.5% Na<sub>2</sub>CO<sub>3</sub>, quartetine, 5% NaNO<sub>2</sub>, AlCl<sub>3</sub>. 6H<sub>2</sub>O 10%, 1M NaOH, Methanol, Chloroform, DMSO, Shrimp Larvae, Sea Water.

### 2.2. Research Procedures

#### **Sampling**

Sawo samples were taken from Kampar, Kampar District, Riau Province. The parts used were the leaves and bark of sawo (*M. zapota* (L.) van Royen).

#### **Sample Preparation**

The dark green leaves and the bark of sawo (*Manilkara zapota* (L.) van Royen), were cleaned first from the inherent dirt, then were dried aerated. After that, dry sorting was done to remove dirt that was left behind during the drying process, cut into small pieces, made into powder and weighed.

#### **Manufacture of sawo Stem Bark Extract (*M. zapota* (L.) van Royen).**

The simplicia powder of sawo leaves and bark was extracted using maceration method with ethanol solvent. Simplicia powder 400 grams of leaves and 120 grams of sawo bark were put into dark colored bottles separately. Then the simplicia was soaked using ethanol solvent for 5 days and occasionally shaken. Next, the maceration was filtered and the pulp was macerated again. The repetition was carried out three times. The collected filtrate was then thickened using a rotary evaporator to obtain a thick extract. After that, the extract was weighed and the yield value was calculated.

#### **Phytochemical Test**

Preliminary test of Total Phenolic and Flavonoid content was carried out on ethanol extract of sawo bark samples (*M. zapota* (L.) according to method [11]:

##### *a. Phenolic Test*

A total of 0.5 grams of thick extract of *M. zapota* (L.) Van Royen stem bark from ethanol solvent was placed on porcelain pellets, then added with methanol, and stirred until homogeneous. After that, FeCl<sub>3</sub> was added. Phenolic presence was characterized by the color formation of green, yellow, orange, or red.

##### *b. Flavonoid Test*

A total of 0.5 grams of thick extract of *M. zapota* (L.) Van Royen stem bark from ethanol solvent, each of which was put into a test tube. Then 5 drops of ethanol were added, and shaken until homogeneous. After that, Mg tape and 5 drops of concentrated HCl were added. The presence of flavonoids was indicated if it produced the color of yellow, orange, and red.

#### ***Analysis of total phenolic and flavonoid bark of sawo plant (M. zapota (L.) van Royen)***

##### **a. Making of Galatic Acid Calibration Curves**

Main solution of 1000 ppm gallic acid was made. 2 mg of Gallat Acid was weighed and put into 2 ml of measuring flask. From the main solution that had been made, a series of 4, 8, 12, 16 and 20 ppm was made. Then 10  $\mu$ l of Folin-Ciocalteu 0.25 N was added, reagent allowed to stand for 5 minutes then 20 $\mu$ l of Na<sub>2</sub>CO<sub>3</sub> was added. 7,5% changed the color to blue. It was then incubated for 30 minutes. The solution with these variations in levels reads its absorption in a UV spectrophotometer with a maximum absorption wavelength of 765 nm. Then from the absorbance, the regression equation is determined.

##### **b. Sample Measurement**

A total of 100  $\mu$ l of sample, gallic or blank acid were mixed with 10  $\mu$ l of Folin-Ciocalteu 0.25 N reagent, allowed to stand for 15 minutes. After that, as much as 20  $\mu$ l of 7.5% Na<sub>2</sub>CO<sub>3</sub> was added to each well, which caused the color changes to blue. The mixture was incubated for 30 minutes in a dark place before absorbance was measured at a wavelength of 765 nm. Phenolic levels were calculated by entering the results of the level of absorption into the standard curve that had been made.

##### **c. Making a Quercetin Calibration Curve**

1000 ppm quercetin main solution was made. 2 mg of quercetin was put into 2 ml of measuring flask. From the main solution that had been made, a series of 8, 16, 24, 32 and 40 ppm was created. Then 60  $\mu$ l of 5% NaNO<sub>2</sub> was added, stood for 5 minutes. Then 50  $\mu$ l AlCl<sub>3</sub> of 10% H<sub>2</sub>O was added. which created yellow color. Let it stand for 30 minutes before finally adding 30  $\mu$ l of 1 M. NaOH. It was incubated for 5 minutes. The solution with these variations in levels reads its absorption on the microplate reader with a maximum absorption wavelength of 510 nm. Then from the absorbance, the regression equation is determined.

##### **d. Sample Measurement**

A total of 100  $\mu$ l of sample was mixed with 60  $\mu$ l of 5% NaNO<sub>2</sub>, let stand for 5 minutes, added 50  $\mu$ l AlCl<sub>3</sub>. 10% H<sub>2</sub>O. There was a change in color to yellow. It was allowed to stand for 5 minutes and finally 30  $\mu$ l of 1 M NaOH was added. Then the mixture was incubated in a dark place at room temperature for 5 minutes. The mixture absorbance was measured at a wavelength of 510 nm. Flavonoid levels were calculated by entering the results of the level of absorption into the standard curve that had been made.

#### ***Activity test for sawo free radical scavenging (M. zapota (L.) van Royen)***

The measurement of antioxidant activity was carried out by the stable free radical method DPPH (1,1-diphenyl-2-picrylhydrazil radical-scavenging). The sample consisted of leaf and bark extract. Each sample was piped to 50 $\mu$ l, then added 80 $\mu$ l of DPPH to 80 $\mu$ g / ml concentration and put into the first well on the microplate. Next, the second well was piped DPPH concentration of 80 $\mu$ g / ml as much as 80 $\mu$ l. Then 50 $\mu$ l methanol was added. The third well was pipetted 50 $\mu$ l in the sample blank and the fourth well was pipetted 50 $\mu$ l in DPPH blank. It was incubated for 30 minutes in a dark place. Then the absorbance of the sample was measured using a microplate reader at a wavelength of 520 nm.

### **3. Results and Discussion**

#### **3.1. Extraction and Partitions**

From the sample of sawo bark (*M. zapota* (L.) van Royen) as much as 0.35 kg, 120 gr dry samples which had been mashed up were obtained. Extraction was carried out by maceration method using 96% ethanol which was distilled for 3x24 hours. After filtering and concentrating using a rotary evaporator, 30,135 gr thick bark ethanol extract was obtained. The extract yield obtained was 25.11%.

### 3.2. Phytochemical test results

Phytochemical test was conducted as a preliminary test qualitatively to determine the secondary metabolite content of plants. Phytochemical test results of fresh bark and sawo bark extract showed the presence of phenolic compounds and flavonoids. Test results on bark extract also showed the presence of phenolic compounds and flavonoids.

**Table 1.** Phytochemical Test Results of sawo bark (*M. zapota* (L.) van Royen)

Phytochemicals	Reactor	Fresh stem bark	Stem Bark extract	Observation result
Total phenolic	FeCl <sub>3</sub>	+	+	Blue to black
Flavonoid	Metal Mg + HCl p	+	+	Pink to reddish

### 3.3. Analysis of total phenolic and flavonoid bark of sawo plant (*M. zapota* (L.) van Royen)

In this study, determining the levels of total phenol compounds in samples was done by using gallic acid (GAE) as a standard solution. Gallic acid was used as a standard solution because it is one of the natural and stable phenols, and is relatively cheap compared to others. Gallic acid is included in the phenolic compound derived from hydroxybenzoic acid which is classified as simple phenolic acid. Galic acid is the choice as a standard for the availability of stable and pure substances [9]. Galic acid is reacted with the Folin-Ciocalteu reagent to produce a yellow color which indicates that it contains phenol, after which it is added with a solution of Na<sub>2</sub>CO<sub>3</sub> to produce blue [10]. Phenolic compounds react with the Folin-Ciocalteu reagent only in an alkaline atmosphere so that proton dissociation occurs in phenolic compounds to phenolic ions, so that Na<sub>2</sub>CO<sub>3</sub> solution is added [8].

The standard solution of gallic acid was measured with variations in concentrations of 20, 40, 60, 80 and 100 µg / mL measured at a maximum wavelength of 744.8 nm. Then the value of absorbance of standard solution of gallic acid was obtained at each concentration. A linear line equation was found which would be used to determine the total phenolic content in samples of ethanol extract of stem bark of *M. zapota* (L.) Van Royen.

The results of absorption measurement of standard gallic acid solution were put into Microsoft Excel to obtain a calibration curve of standard gallic acid solution in the form of a graph of concentration versus absorption curve (Figure 1)



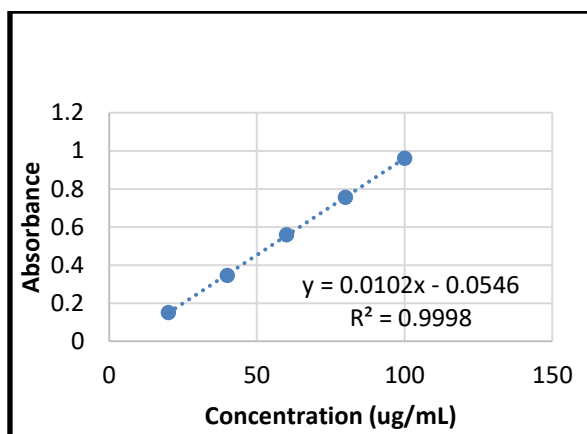


Figure 1. Standard Curve Error Curves

Based on the graph, it can be seen that the calibration curve with regression equation for absorption of gallic acid at concentrations of 20,40, 60, 80, and 100 µg / mL is  $y = 0,010x - 0,054$ . In the standard solution of phenol compounds, a linear relationship between absorbance and concentration is obtained. In absorbance measurements which are indicated by the correlation coefficient (r) of 0.999, this value (r) is close to 1 which indicates that the regression equation is linear.

Phenolic compounds and flavonoids are secondary metabolites found in plants. The results obtained in this study indicate a significant level of phenolic compounds in ethanol extract, sawo bark (Tab. 2).

**Table 2.** Results of measurements of total phenolic levels of Sawo bark extract

Sample	Replication	Absorbance	Average Absorbance	Initial phenolic content (mg/mL)	Total phenolic (mgGAE/g eks)
EKBS*	1	0,587	0,582	0,052	12,977
	2	0,574			
	3	0,584			

\*EKBS = Sawo Stem Bark Extract

The antioxidant activity of this extract is probably caused by the presence of phenolic compounds possessed by extracts [9]. In previous studies, phenolic compounds were known to have various biological effects as antioxidants, protecting cell structures, anti-inflammatory, and as antiseptics [3].

To determine the level of total flavonoid compounds in the sample, quercetin (QE) is used as a standard solution. In the measurement of total flavonoid levels, the addition of  $AlCl_3$  can form a complex, so that the wavelength shift towards visible (visible) marked with a solution produces a more yellow color. The addition of potassium acetate to maintain the wavelength is in the visible area [8].

Quercetin standard solutions were measured with variations in concentrations of 20, 40, 60, 80 and 100 µg / mL measured at a maximum wavelength of 431 nm. The absorbance value of the quartetin standard solution was obtained at each concentration. A graph of the concentration curve versus the absorbance of the linear line equation (Figure 2) was obtained.

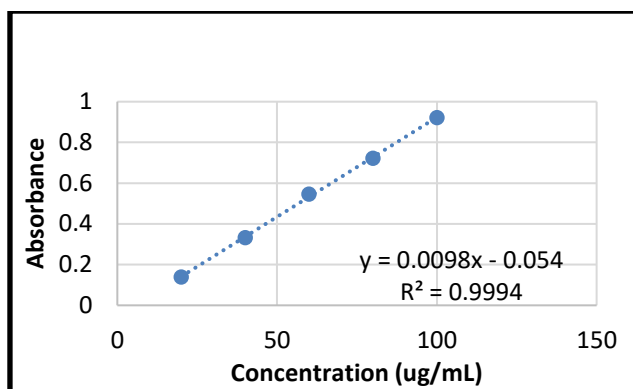


Figure 2. Quercetin Standard Curves

From the graph of the standard quercetin solution, the linear regression equation  $y = 0.009x - 0.054$  was obtained. A standard solution of flavonoid compounds obtained a linear relationship between absorbance and concentration. In the absorbance measurement which is indicated by the correlation coefficient ( $r$ ) of 0.999, this value ( $r$ ) is close to 1 which indicates that the regression equation is linear which will be used to determine the total flavonoid levels in the *M. zapota* bark ethanol extract sample (L.) Van Royen

**Table 3.** Results of measurements of the flavonoid levels of Sawo bark extract

Sample	Replication	Absorbance	Average	Initial phenolic content (mg/mL)	Total phenolic (mgGAE/g eks)
EKBS*	1	0,397			
	2	0,394	0,396	0,035	8,755
	3	0,396			

\*EKBS = Sawo Stem Bark Extract

The benefits of flavonoids include protecting the cell structure, increasing the effectiveness of vitamin C, anti-inflammatory, preventing bone loss and as an antibiotic [12]. According to research by Kurniasari (2006), a number of medicinal plants containing flavonoids have been reported to have antioxidant, antibacterial, antiviral, anti-allergic and anticancer activities.

### 3.4. Activity test of free radical scavenging of bark extract of *M. zapota* (L.) van Royen

The test activity of free radical scavenging by DPPH method was done to determine how much activity a sample was to inhibit DPPH stable radicals by donating hydrogen atoms. Samples that have antioxidant activity will reduce DPPH to DPPH-H which is marked by a purple to yellow color change [9].

**Table 4.** Results of measurement of free radical scavenging activity of Sawo bark extract

Sample	Concentration (ug/mL)	ln	Repetition			Average	Abs Sampl e	% Inhibitio n	IC50 (ug/mL)
			1	2	3				
EKBS	1000	6,90	0,11	0,11	0,11	0,114	0,012	96,747	
		8	8	2	2				
	500	6,21	0,14	0,14	0,14	0,142	0,039	88,826	
		5	2	1	3				
	250	5,52	0,17	0,17	0,17	0,175	0,073	79,491	
		1	6	6	3				
125	4,82	0,20	0,20	0,20	0,207	0,104	70,533	19,698	

	4,13	0,23	0,23	0,23				
62,5	5	8	3	3	0,235	0,132	62,612	
	3,44	0,25	0,25	0,25				
31,25	2	4	8	1	0,254	0,151	57,049	

\*EKBS = Sawo Stem Bark Extract

From the table, it can be seen that there is a correlation between the total content of total polyphenols and flavonoids on the activity of free radical scavenging, where the high levels of total polyphenols and flavonoids in the extract also provide high activity for free DPPH Scavenging radicals.

## CONCLUSION

Based on the results of the research that has been done, it can be concluded that:

1. Extract of *M. zapota* (L.) Van Royen stem bark contains phenolic group compounds of 12.97 mgGAE / g extract calculated against Galatic Acid.
2. Extract of *M. zapota* (L.) Van Royen stem bark contains flavonoid group compound of 8.75 mgQE / g extract calculated against quercetin.
3. Activity of free radical scavenging extract produces IC50 value of 19.69 ppm.

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# Utilization of Waste Stem of Oilpalm For The Manufacture of Particle Board Composite Sound Absorbency

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**Abstract.** A common problem experienced by people in Indonesia is the increase in pollution, one of which is noise pollution (noise). Therefore, in this study a composite board is intended to be used as a sound absorber. This study aims to determine the acoustic properties of particle board made from palm frond waste. Composite boards are made from palm oil midrib waste using urea formaldehyde matrix as an adhesive. The composite board is made with 10%, 15% adhesive fraction and then the absorption coefficient test is carried out. The results obtained in the test showed that the average board density obtained was 0.402 g/cm<sup>3</sup>, 0.601 g/cm<sup>3</sup> and 0.922 g/cm<sup>3</sup> for the 10% adhesive board while for the 15% adhesive the average board density produced was 0.406 g/cm<sup>3</sup>, 0.618 g/cm<sup>3</sup>, 0.955 g/cm<sup>3</sup>. Judging from the resulting particle board included is in the category of medium quality particle board. For testing the absorption of particle board produced at a frequency of 500 Hz as the mean of 0.9, it is included in the category of high-quality particleboard according to ISO 11654 standard.

## 1. Introduction

Activities in the community cause various problems, such as the pollution of noise. Currently there are many materials in the market that can reduce noise such as glass-wool, rockwool and gypsum, but that materials are very expensive so people try to find other alternatives by making of cheap, practical and widely available materials in nature. One of them is palm fronds.

Oil palm plants produce 3 main types of waste, namely palm fronds, palm oil sludge and palm kernel cake. This waste is quite abundant throughout the year, but its use has not been maximized, especially as an industrial material.

Technology in the material field is sustainable develop. Humans need material to be used in a variety of purposes. For this reason knowledge and technology are needed to make maximum use of natural resources. Basically, the advantages of each material cause the development of material use. For example, at this time we need materials that are cheap, lightweight, strong, and easy to obtain. Therefore, currently material commonly referred to as composite material is developing, which is a composite material of several types of material, which turns out having different characteristics with the nature of the main material after two different types of material were combined.

The results of Khuriati et al research on "Absorption of Sound Waves by Sound Absorbers Made from Coconut Fiber Composite Materials" show that coconut fiber meets the requirements for sound absorbers according to ISO 11654, namely with a sound absorption coefficient ( $\alpha_w$ ) above 0.15. In addition, Setyanto et al stated that composite sound absorption panels made from paper waste and coconut fibers have a sound absorption coefficient of 0.25 at the reference frequency (500Hz) and have met the minimum standard of sound absorption coefficient based on ISO 11654: 1997. Fatimah et al also stated that composites from betel bark fibers can absorb sound with an average absorption coefficient value of composite boards obtained respectively 0.11; 0.06; 0.05 and 0.06 for adhesive fractions 10%, 15%, 20% and 25%. This is in accordance with the standards set by ISO 10534-2: 1998 (GB / T 18696.2-2002) that a material is categorized as being able to absorb sound if it has a sound absorption coefficient greater than 0.05.

Utilization of solid waste of oil palm fronds as the basic material for sound absorption particle board is expected to be one solution to the problems of oil palm plantation waste, the development of particle board products and problems related to the environment and pollution.

## 2. Materials and Methods

### 2.1 Materials and obtained samples

We use raw materials in the form of palm frond waste from oil palm plantations in Riau Province. The midrib obtained is given a treatment in the form of a reduction in water content and grinding to get the material in the form of decomposed fibers. In this study the experimental design used was a completely randomized design pattern (Completely Randomized Design) with factorial experiments. The factor used consists of two factors, namely the amount of adhesive P1 = 10%, P2 = 15% with the target board density K1 = 0.4 gr / cm<sup>3</sup>; K2 = 0.6 gr / cm<sup>3</sup>; K3 = 0.9 gr / cm<sup>3</sup>.



Figure 2.1 Oil palm fronds

### 2.2 Physical characterization

For testing the physical properties, the tests carried out are testing the target density which refers to the standard SNI Number 03-2105-2006.

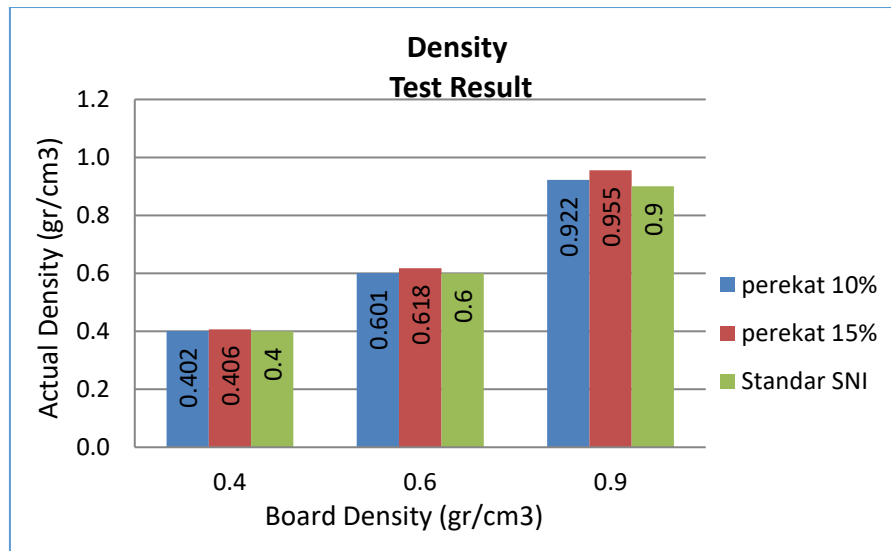
### 2.3 Sound absorber Characterization

Composites in this study are intended for room partition panel applications. And it is expected that the room partition panel has sound absorption capability as indicated by the sound absorption coefficient value. To find out the sound absorption coefficient owned by composite particle board, sound absorption test was carried out using 2 microphones impedance tube test based on ASTM E1050-98 test standard.

## 3. Result and Discussion

### 3.1 Physical Characterization

Particle board density testing is carried out using a test material with a size of 10 x 10 cm. The test results of particle board density obtained can be seen in Figure 3.1.

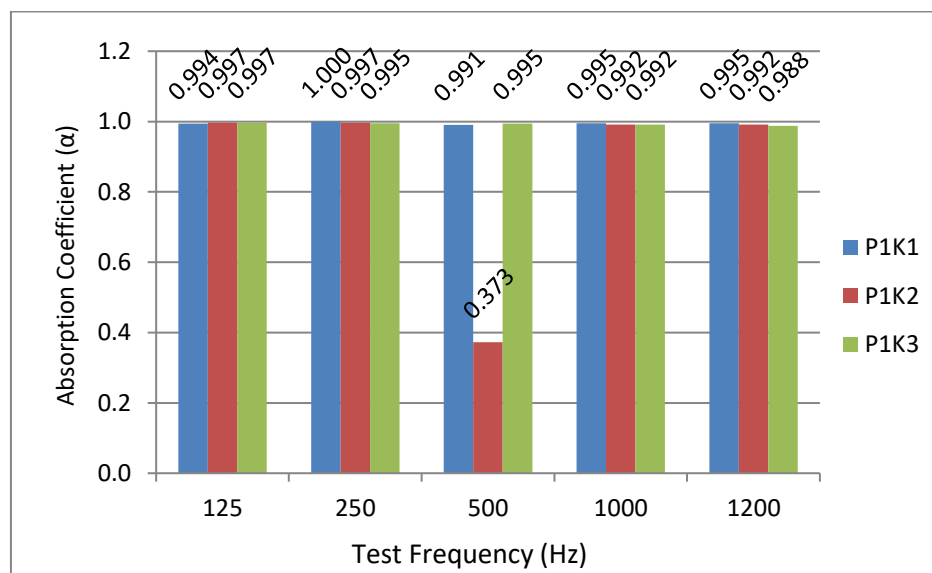


**Figure 3.1** The results of particle board density test

The intended density in this study was 0.4 gr / cm<sup>3</sup>, 0.6 gr / cm<sup>3</sup> and 0.9 gr / cm<sup>3</sup>, but the results achieved on average exceeded the intended density. The highest yield was 0.955 gr / cm<sup>3</sup> at a density of 0.9 with an adhesive amount of 15%. Based on the data we obtained the resulting particle board fulfilled the desired density target. This can be caused by pressure presses that are high enough to make particle boards from palm fronds fibers.

### 3.2 Sound absorber Characterization

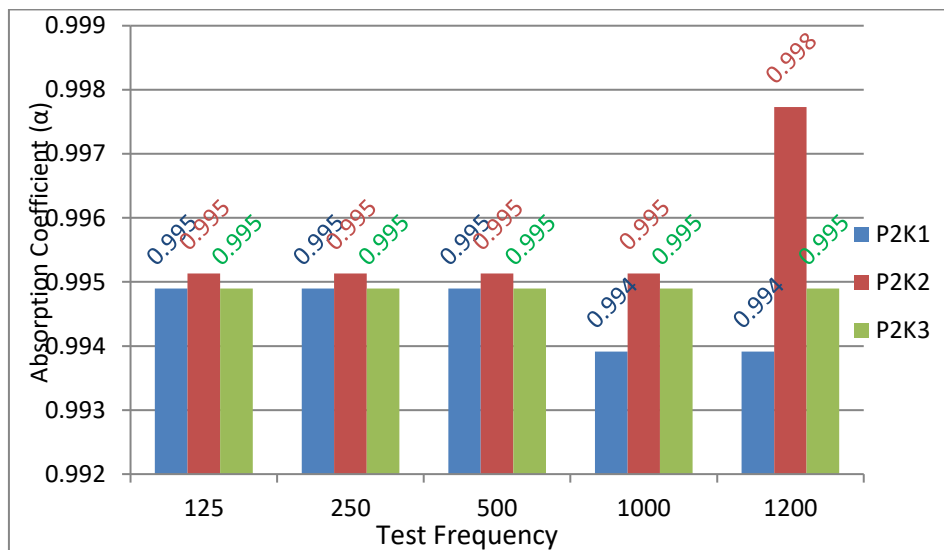
Sound absorption coefficient owned by composite particle board, sound absorption test was carried out using 2 microphones impedance tube test based on ASTM E1050-98 test standard. Here is a graph of the absorption coefficient of the test results:



**Figure 3.2** sound absorption test results with 10% adhesive

Absorption testing is carried out at a frequency of 125Hz - 1200Hz, considering the flexibility of the panel (the panel has a soft surface), so testing at frequencies above 1200 Hz is less necessary (the test results generally show numbers that are always stable at small absorption coefficients for high frequency sounds).

Graph 3.2 shows the variability of the absorptive coefficient. On the panel with a 10% adhesive density of 0.4 g / cm<sup>3</sup> the absorption coefficient produced is relatively stable from the lowest frequency to the highest frequency due to the low particle density and the porous board surface so that the absorption capacity is high. For 0.6 g / cm<sup>3</sup> density particle board, the resulting absorption coefficient varied, ie stable at low frequencies, continuously decreasing and reaching the lowest point at a frequency of 500 Hz, then rising again. But on the panel with a density of 0.9 g / cm<sup>3</sup> the absorption coefficient value tends to continue to decline, as the sound frequency is tested. The NRC value of each ingredient is: at 0.4 g / cm<sup>3</sup> is 0.995, on the panel with a density of 0.6 g / cm<sup>3</sup> is 0.870 and on the panel with a density of 0.9 g / cm<sup>2</sup> is 0.993.



**Figure 3.3 The results of sound absorption test with 15% adhesive**

Figure 3.3 shows the variability of the absorption coefficient. In the panel with a density of 0.4 g / cm<sup>3</sup> the resulting absorption coefficient is relatively stable from the lowest frequency to the intermediate frequency but has decreased in high frequencies, namely at the frequency of 1000 - 1200 Hz this is due to the increase in adhesive content so that the absorption capacity is reduced. For particle board with density of 0.6 g / cm<sup>3</sup> the absorption coefficient produced was relatively stable, but experienced a very drastic increase in the frequency of 1200 Hz. While on the panel with a density of 0.9 g / cm<sup>3</sup>, the absorption coefficient value has a stable absorption. The NRC value of each material is: The panel with a density of 0.4 g / cm<sup>3</sup> is 0.995, on the panel with a density of 0.6 g / cm<sup>3</sup> is 0.995 and the panel with a density of 0.9 g / cm<sup>3</sup> is 0.995.

#### 4. Conclusion

We observed that panels made from oil palm midrib have excellent sound absorption capability. With various variations of adhesive content and density, satisfactory results were obtained. From the results of testing the physical properties it was found that all test specimens were able to meet the intended target density, while the results of the sound absorption test analysis showed varied absorption coefficient values. On the panel with 10% and 15% adhesive, the resulting absorption coefficient is quite satisfying, referring to the ISO 11654 standard on acoustics, the average panel produced has an A classification that is with  $\alpha_w$  between 0.9 - 1.0.

#### 5. Acknowledgement

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## **Expert System for Detecting Disease caused by *Aedes Aegypti* Mosquito Bites Using Case Based Reasoning Method**

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**Abstract.** Disease caused by mosquito bites is one of the diseases that need special attention, especially in Riau Province because this disease has the potential to fall into the category of extraordinary events (KLB). Data recorded in the Riau Provincial Health Office in 2015 reveals that patients who contracted the virus due to mosquito bites, namely dengue fever reached 3,261 people (IR = 51.4 per 100,000 population) and mortality rate of 20 people (CFR = 0.61%). When this virus is already endemic and becomes an extraordinary event, a quick treatment is needed to reduce the loss of life, especially for the initial diagnosis of the disease. This study aims to design and build an expert system that is used to diagnose diseases caused by the bite of aedes aegypti mosquitoes so that even common people can easily find out whether they have contracted the virus due to the bite of aedes aegypti mosquito or not. The identified diseases are dengue fever, chikungunya and zika. Expert system developed uses the Case based Reasoning (CBR) method. To measure the level of similarity, euclidean distance measuring instrument is used. The expert system developed produces a system with an accuracy rate of 80%. This value is the same as the threshold value specified by the expert.

# Prebiotic Test of Three Variety of Mushrooms (*Auricularia polytricha*, *Agaricus bisporus*, and *Pleurotus cystidiosus*) Towards “*Lactobacillus casei*” Bacteria

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**Abstract.** One formulation of maintenance of normal intestinal microbiota for diarrhea therapy in infants and children can use mushroom prebiotics. Mushroom polysaccharides are a potential source of prebiotics because they contain nutrients such as chitin, hemicellulose,  $\alpha$  &  $\beta$ -glucans, mannas, xylans and galactose. Prebiotics cannot be separated from probiotics because the prebiotic target stimulates selective growth of probiotic bacteria. One of the probiotic bacteria is *Lactobacillus casei*. The purpose of this study is to determine the prebiotic activity of several fungi against *Lactobacillus casei*. The mushrooms used are black ear mushroom (*Auricularia polytricha*), white button mushroom (*Agaricus bisporus*) and brown oyster mushroom (*Pleurotus cystidiosus*) with 4 variations of concentration (3.125% b / v, 6.25% b / v, 12.5% b / v and 25% b / v) affecting the growth of *Lactobacillus casei* bacteria measured by absorbance of bacteria using a spectrophotometer at a wavelength of 434 nm. Black ear mushroom (*Auricularia Polytricha*), white button mushroom (*Agaricus bisporus*) and brown oyster mushroom (*Pleurotus cystidiosus*) have the potential to be a prebiotic to the *Lactobacillus casei* bacteria. The highest prebiotic activity is brown oyster mushroom (*Pleurotus cystidiosus*). Result analysis in this research is using Two-Way Anova.

## 1. Introduction

Diarrhea is a major public health problem in developing countries such as Indonesia, because of its high morbidity and mortality. In Indonesia diarrhea becomes the second most killer of babies after Acute Respiratory Infection (ISPA) and often lead to Extraordinary Events (KLB) (Lolopayung, et al., 2014). According to data from the World Health Organization (WHO) in 2006, every 1 in 5 deaths of children under the age of five years worldwide die of diarrhea with a total of around 760,000 deaths each year. And According to data from the Riau Provincial Health Office in 2012 diarrhea is the second most common cause of under-five mortality by 17.2% after neonatal problems (asphyxia, low birth weight, infection) by 36%.

Several attempts have been made to overcome acute diarrhea, especially among children, namely by consuming prebiotics and probiotics. According to Moller and Vrese (2004) some research results prove that certain probiotic bacteria such as bifidobacteria and lactobacillus can strengthen the immune system and overcome diarrhea, both by rotavirus and by bacteria and overcome constipation. In Alasir's (2007) study, it was shown that administration of probiotics in non-specific acute diarrhea of infants and children can shorten the duration of diarrhea, reduce the frequency of diarrhea, and increase weight gain significantly.

Prebiotics cannot be separated from probiotics because the prebiotic target is to stimulate selective growth of probiotic bacteria (Roberfroid, 2000). Therefore, the benefits of using prebiotics are

inseparable from the role of probiotics to regulate and modulate the population microbiology of probiotic bacteria.

The World Health Organization (WHO) defines probiotics as living microorganisms which when given in sufficient quantities can provide health benefits to humans. The following types of probiotics are good for the health of the human body, namely *Bifidobacterium*, *Lactobacillus*, *Saccharomyces* and *Streptococcus* species (Praja, 2011) and *L. casei* Shirota strain, *L. reuteri*, *L. acidophilus* LA-1, *L. gasseri*, *L. rhamnosus*, *Bifidobacterium lactis* Bb-1, *B. breve*, *B. longum* (Harti, 2009).

The fungi as a biological source before being used optimally, in addition to being consumed has a potential prebiotic mushroom because it contains carbohydrates such as chitin, hemicellulose,  $\beta$ - and  $\alpha$ -glucans, mannas, xylans and galactants (Aida, et al., 2009).

Mushroom plants that contain carbohydrates are Black Ear Mushrooms 38.4% (Liana, et al., 2015), button mushrooms 3.26 g (Valverde, et al., 2015). Oyster mushrooms contain 56.6% carbohydrates (Yunita, 2011). Also polysaccharides of oyster mushrooms can stimulate the growth of intestinal microorganisms (probiotics), namely as prebiotics (Widyastuti, et al., 2011). Prebiotics are indigestible food ingredients that have beneficial effects by stimulating the growth of bacteria that naturally live in the intestine. Prebiotics are also said to be carbohydrates that are not digested by the body, but can be digested by microbes that are beneficial for improving health (Praja, 2011). Most carbohydrates found in nature are found as high molecular weight polysaccharides (Thenawidjaja, 1982).

For that reason, in this study, prebiotic compounds were isolated from 3 varieties of mushrooms (black ear mushrooms, white button mushrooms and brown oyster mushrooms). Then an activity test was conducted to see their effect on increasing the growth of probiotic bacteria. This study applies the prebiotic polysaccharide concept of fungi to the formula for the maintenance of the normal intestinal microbiota ecosystem for diarrhea therapy in infants and children as a series of studies in order to utilize natural ingredients, abundant mushrooms, cheap and easily obtained as a source of prebiotic compounds in the implementation of strategies treatment that does not involve antibiotics and antidiarrheal.

## 2. Methodology

**Test material.** The materials used in this study are black ear mushrooms, white buttons and brown oysters obtained from mushroom cultivation (Jamur Riau Mitra Mushroom) Pekanbaru.

**Chemical material.** The chemicals used are MRS Agar, MRS Borth, phosphate buffer, 70% alcohol, distilled water.

**Isolation of Mushroom Polysaccharides.** Each fresh mushroom was blended plus 70% alcohol and then squeezed and filtered until a solvent was obtained, then decanted and centrifuged at 3000 rpm. Then the extract obtained was tested for prebiotic activity (Kusumawati, et al., 2005).

**Making Test Solvent.** Test solvent is made from mushroom extract. The main liquor was made by dissolving 2.5 grams of extract for chocolate oyster mushroom and black ear mushroom and 1.5 grams of white button mushroom extract each extract plus phosphate pH  $\pm$  7 buffer of 5 ml, then each solution was diluted with double dilution made 4 series of concentration of 25% b / v; 12.5% b / v; 6.25% b / v; 3.125%, b / v and blank.

**Rejuvenation of the *Lactobacillus casei* bacteria.** It was obtained from PAU UGM in a freeze so it needed rejuvenation. Rejuvenation of pure cultures of *Lactobacillus casei* bacteria on MRS media was incubated for 48 hours at 37 ° C (Rahayu, 2014).

**Prebiotic Activity Test for Fungi.** A total of 2500  $\mu$ l of MRS Borth were added with 100  $\mu$ l of *Lactobacillus casei* suspension and 200  $\mu$ l of test preparation, then incubated at 35-37°C for 24 hours. The absorbance measurement was carried out at the maximum wavelength of the *Lactobacillus casei* suspension, which was 434 nm. Work was done in duplo (Kusumawati, et. Al., 2005).

**Result Analysis.** The data obtained were analyzed using Anova Completely Randomized Design (Anova CRD) / Anova Two Way at a 95% reliability level. From the calculation results, if F count is greater than F table or the significance is less than 0.05, it indicates a significant difference between treatment groups (Kusumawati, et al., 2005). And the calculation continued with the Tukey Test to find

out whether the difference between each treatment group is significant (significant) or insignificant (Santoso, 2006).

### 3. Result

The mushrooms were cleaned and weighed each weighing 500 grams. Each mushroom was finely blended and added with 70% alcohol, then filtered and squeezed to get sediment. After that, each sediment obtained was decanted. Then each sediment was centrifuged at 3000rpm for 15 minutes, each extract was obtained and then weighed the results of each extract. Next the test of prebiotic activity in each extract obtained was carried out (Kusumawati, et al., 2005).

What the researchers did in the organoleptic test for black ear mushrooms was in the form of black colored extracts such as jelly, odorless, insoluble in water. The color of white button mushroom is yellowish white color extract, odorless, insoluble in water and brown oyster mushroom has a grayish brown color extract, odorless and insoluble in water.

Polysaccharides are polymeric monosaccharide molecules that can chain straight or branch and can be hydrolyzed with specific enzymes that work. The results of hydrolysis will partly produce oligosaccharides and can be used to determine the molecular structure of polysaccharides (Winarno, 1997). Some polysaccharides function as storage forms for monosaccharides, while others function as structural elements in cell walls and binding tissues (Thenawidjaja, 1982). Polysaccharides are potential mushrooms as prebiotics that can prevent viral infections and can stimulate the growth of probiotic bacteria in the large intestine (Bakhta, 2014).

For the activity test, a 50% solution was made from the main source then double dilution was done. Making this solution and dilution is done aseptically in 'laminar air flow.

Then the dilution series of test preparation was used for testing in vitro activity with liquid media. A total of 2.5 ml of liquid medium was added with 100 µl of Lactobacillus casei suspension and 200 µ of the test. Then it was incubated at 35-37°C for 24 hours. The measurement of the absorbance is carried out with the maximum wavelength of the 434 nm Lactobacillus casei suspension using a UV-VIS spectrophotometer (Kusumawati, et al., 2005). The results are listed in table 1.

**Table 1.** Absorbance of each concentration group measured using a spectrophotometer at a wavelength of 434 nm.

Sample	Control	Group I	Group II	Group III	Group VI
Brown Oyster Mushroom	0.418	0.687	0.997	1.420	1.638
	0.418	0.695	0.966	1.460	1.600
Black Ear Mushroom	0.463	0.769	0.827	0.945	0.984
	0.463	0.756	0.845	0.943	0.969
White Button Mushroom	0.344	0.354	0.447	0.553	0.983
	0.344	0.365	0.445	0.536	1.029
	X = 0,408	X = 0,604	X = 0,775	X = 0,976	X = 1,201

**Description.** Control I: media + phosphate buffer; Control II: media + phosphate buffer + bacterial suspension; Group I: liquid medium + bacterial suspension + test amount (3.12% b / v); Group II: liquid medium + bacterial suspension + test amount (6.25% b / v); Group III liquid medium + bacterial suspension + test (12.5% b / v); Ex IV: liquid medium + bacterial suspension + test (25% b / v).

From the data above, statistical analysis is performed using Anova Completely Randomized Design (CRD) / Anova Two Way at a 95% reliability level. The results of which are listed in table 2 and table 3.

**Table 2.** Summary of Two Way Anova statistics from the absorbance data of each dilution group

Source of Variation	Sum of Squares (SS)	Degree of Freedom (df)	Average Square (MS)	F Count	Significant
Between samples and concentration	0,636	8	0,079	374,882	0,000

**Table 3.** Summary of Tukey HSD calculations from the absorbance of each concentration group

K	K	I	II	III	IV
I	-0.19600*	0.19600*	0.35117*	0.56783*	0.79217*
II	-0.35117*	-0.15517*	0.15517*	0.37183*	0.59617*
III	-0.56783*	-0.37183*	-0.21667*	0.21667*	0.44100*
IV	-0.79217*	-0.59617*	-0.44100*	-0.22433*	0.22433*

(\*).There are significant differences between concentration groups

**Description.** Control I: media + phosphate buffer; Control II: media + phosphate buffer + bacterial suspension; Group I: liquid medium + bacterial suspension + test amount (3.12% b / v); Group II: liquid medium + bacterial suspension + test amount (6.25% b / v); Group III liquid medium + bacterial suspension + test (12.5% b / v); Ex IV: liquid medium + bacterial suspension + test (25% b / v)

From the calculation of Anova above, it is known that significant 0.00 means smaller than 0.05, so it can be concluded that there is at least one set of groups that have significant differences. The calculation is continued with the Tukey HSD test in which the results can be seen in table 3.

From the results of the statistical analysis above, it can be seen that there are significant differences between the control group and the test solution group with a concentration of 3.125% w / v, 6.25% w / v, 12.5% w / v and 25% b / v. So it can be concluded that these four concentrations are able to increase the growth of *Lactobacillus casei* bacteria. From the results of calculating the concentration of isolates in liquid media carried out in duplicate on the average absorbance data, brown oyster mushrooms is 0.691, 0.982, 1.440 and 1,619, black ear mushroom is 0.763, 0.836, 0.943, and 0.997, and white button mushrooms is 0.360, 0.446, 0.545 and 1.006. It can be concluded that the higher the sample concentration, the higher the average absorbance *Lactobacillus casei*.

#### 4. Conclusion

From the research that has been done, it can be concluded that black ear mushroom (*Auricularia polytricha*), white button mushroom (*Agaricus bisporus*) and brown oyster mushroom (*Pleurotus cystidiosus*) have prebiotic activity against the *Lactobacillus casei* bacteria. The results of data analysis performed using Two-Way Anova at 95% reliability level shows that the results of all test samples are 0.000 (Significant <0.05), so all test samples have significant differences and influence on the *Lactobacillus casei* bacteria.

The highest prebiotic activity is brown oyster mushroom (*Pleurotus cystidiosus*).

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## Phytochemical Screening and KLT Analysis of Endophytic Fungi Secondary Metabolite of *Vetiveria zizanioides* L.

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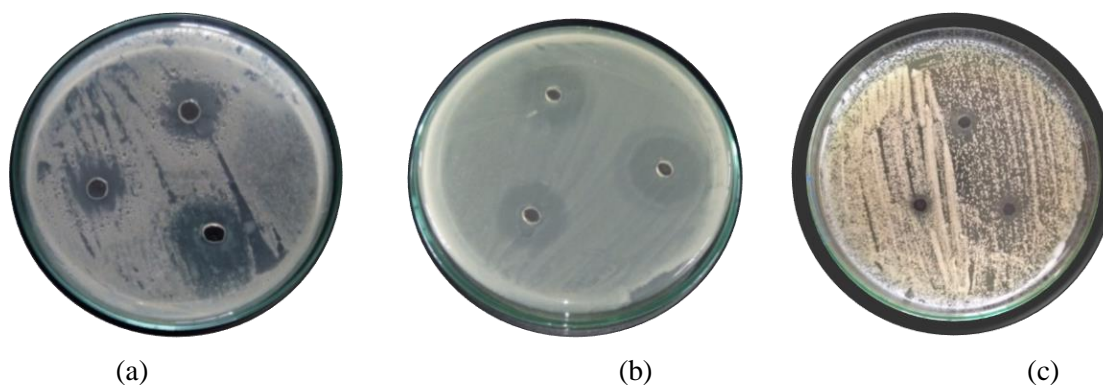
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**Abstract.** Endophytic fungi are microorganisms that live in the healthy tissue of the host plant without causing disease. Endophytic fungi grow in every plant, including vetiver roots of *Vetiveria zizanioides* L. both intracellular and intercellular. This study aims to do phytochemical screening and Thin Layer Chromatography(KLT) analysis of secondary metabolites produced by endophytic fungi from vetiver roots. The results showed that secondary metabolites produced by endophytic fungi contain one or more compounds, namely in the form of terpenoids, steroids, alkaloids, phenolics, flavonoids, and saponins. All fungal isolates produce secondary metabolites in the form of alkaloids except IH2 and IH11 isolates. The results of KLT strengthened the phytochemical screening results on secondary metabolites produced by endophytic fungi with Rf values of 0.6-0.8.

### 1. Introduction

Endophytic fungi are fungi that live in the tissues of host plants without causing symptoms of disease [1,2]. Endophytic fungi play a role in protecting the host against insect pests [3], as a growth regulator [4] producing hydrolytic enzymes such as amylase, cellulase, xylanase, ligninase [5] and chitinase [6]. In addition, endophytic fungi are able to produce the same secondary metabolites as the host [7]. Secondary metabolite products can function as antimicrobials [8], antifungal and cytotoxic [9], antiviral, anticancer, antidiabetic, antimalarial, antioxidant and antiimmunosuppressive [1]. Endophytic fungi can be found in various types of plants, especially medicinal plants. Endophytic fungi isolated from medicinal plants can produce secondary metabolites that are higher than the original plants [10]. One type of aromatic plants that are widely used in treating various diseases are vetiver roots (*Vetiveria zizanioides* L.) Based on phytochemical analysis of vetiver extract, it is known to contain alkaloids, amino acids, flavonoids, saponins and tannins [11] which are useful as antifungal agents, antioxidant and antibacterial [12]. Harahap & Elsie (2017) have successfully isolated 34 endophytic fungus isolates from vetiver root (*V. zizanioides* L.). Of the 34 isolates that were isolated, 22 isolates were able to produce bioactive compounds that could inhibit the growth of *Staphylococcus aureus*, *Escherichia coli* and *Candida albicans* (Figure 1) in the strong category.



**Figure 1.** Antimicrobial activity test of endophytic fungi isolates from vetiver roots (*V. zizanioides* L.) in inhibiting the growth of (a) *Staphylococcus aureus*; (b) *Escherichia coli*, (c) *Candida albicans*

Endophytic fungi are useful in the pharmaceutical industry because of their ability to produce secondary metabolites such as alkaloids, flavonoids, steroids, terpenes, quinones, phenols, which have great potential as bioactive compounds [13]. The magnitude of the potential for endophytic fungi isolates in producing bioactive compounds is the potential that must be developed. However, the bioactive compounds produced by the fungus are unknown. Therefore, phytochemical screening and KLT analysis are needed from the crude extract of endophytic fungus fermentation media of vetiver root to determine the secondary metabolite content produced and expected to be the same as the host plant.

## 2. Material and Methods

### 2.1 Preparation of Endophytic Fungus Isolates

A total of 22 from 34 isolates of endophytic fungi from vetiver root that have high ability in inhibiting microbial growth were selected and then grown on MEA media (Malt Extract Agar) at room temperature for 7 days.

### 2.2 Endophytic Fungus Fermentation

After fungus isolates had been grown for  $\pm 7$  days in MEA media, each isolate was taken using 3 sterile straws. Isolates were fermented to get secondary metabolites in the media of PDB as much as 20 ml in erlenmeyer. Medium containing endophytic fungi isolates was in static condition and placed at room temperature. This fermentation process lasted for  $\pm 21$  days.

### 2.3 Screening of Endophytic Fungi Phytochemical Compounds

Coarse extracts of secondary metabolites of endophytic fungi which have antimicrobial activity in previous studies were then carried out by phytochemical screening to determine the class of compounds contained therein, including terpenoids, steroids, alkaloids, flavonoids, phenolics, and saponins. Positive extracts of secondary metabolites were then monitored using thin layer chromatography (KLT).

## 3. Results and Discussion

### 3.1. Phytochemical Screening of Endophytic Fungus Secondary Metabolite

Phytochemical screening was carried out on endophytic fungi secondary metabolites which included examination of terpenoids, steroids, alkaloids, phenolics, flavonoids, and saponins. Phytochemical screening results revealed that the secondary metabolites produced by endophytic fungi from vetiver mostly contained alkaloids except IH 2 and IH isolates. Some isolates produced secondary metabolites containing terpenoids, steroids, alkaloids, phenolics, flavonoids, and saponins (Table 1. ) This is in line with the phytochemical analysis of vetiver extract which is known to contain alkaloids, flavonoids, saponins, tannins and steroids [14]. The same type of secondary metabolite produced by endophytic fungi with host plants is thought to be the result of coevolution or genetic transfer (genetic recombination) from host plants into endophytic microbes [4]. Some endophytic fungi isolates produce one or more chemical compounds, IH2 isolates, IH3, IH4, IH11, IH 18, IH 22, IH 29 and IH30 contain terpenoids. Steroids are found in secondary metabolites produced by IH 33 isolates while saponins are found in secondary metabolites produced by IH 24 isolates. This is because the formation of secondary metabolites is coded by a number of genes found in chromosomal DNA or plasmid DNA. The gene will appear when given induction first. The induction process can be the addition of a precursor compound or the addition of a certain amount of isolate inoculum in the fermentation process. Some conditions that affect secondary metabolites are limited nutrients available in a microbial growing environment, addition of inducing compounds and decreased growth velocity [15].

Flavonoid compounds are synthesized by plants as a defense system and in response to infections by microorganisms, so these compounds are effective as antimicrobial compounds against a number of microorganisms [16]. Flavonoid compounds that act directly as antibacterial work by denaturing bacterial cell proteins and damaging cell membranes irreparably [17]. The content of the compounds produced by endophytic fungi has an antimicrobial role, and this can be seen in previous studies where the endophytic fungus is able to inhibit the growth of *S. aureus*, *E.coli* and *C.albicans*. Saponins and steroids / triterpenoids produced by endophytic fungi have the ability to be antimicrobial [18,19].





**Table 1. Phytochemical Screening of Endophytic Fungus Secondary Metabolite from Vetiver Root**

No	Compound	Endophytic Fungi Isolate																						Positive Reaction (Discoloration)
		IH 1	IH 2	IH 3	IH 4	IH 8	IH 9	IH 11	IH 13	IH 15	IH 18	IH 19	IH 21	IH 22	IH 23	IH 24	IH 26	IH 27	IH 29	IH 30	IH 31	IH 32	IH 33	
1	Terpenoid	-	+	+	+	-	-	+	-	-	+	-	-	+	-	-	-	-	+	+	-	-	-	Purplish red
2	Steroid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	Blue-green
3	Alkaloid																							
	a.Dragendorff	+	-	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Orange
	b.Mayer	+	-	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	White
4	Fenolik	+	+	+	+	-	+	+	+	-	+	+	+	-	-	+	-	-	+	+	+	+	-	Blackish green
5	Flavonoid	-	-	-	-	+	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	+	-	Orange-red
6	Saponin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	Stable foam ± 10 minutes

Description: (+) detected, (-) not detected

### Analysis of Secondary Metabolites by Using KLT

The results of the analysis of secondary metabolites using Thin Layer Chromatography (KLT) and seen in UV light 254 nm (Table 2) were carried out with the aim to further strengthen the results obtained from the phytochemical test. The results of the analysis with KLT show that the Rf value is 0.6-0.8. These results indicate that the antimicrobial activity produced by secondary metabolites from endophytic fungi is due to containing flavonoid compounds. Analysis of thin layer chromatography (KLT) was carried out on vetiver extracts and obtained Rf values of 0.63-0.75. The Rf value shows that vetiver extract contains flavonoids which play a role in inhibiting bacterial growth [14].

**Table 2. The Results of KLT Analysis of endophytic fungi isolate secondary metabolites of vetiver root (*V.zizanioides* L.)**

No	Isolate Code	Motion Phase ( N- hexane:ethyl acetate)
1.	IH 1	0,77
2.	IH 2	0,67
3.	IH 3	0,65
4.	IH 4	0,72
5.	IH 8	0,67
6.	IH 9	0,75
7.	IH 11	0,7
8.	IH 13	0,67
9.	IH 15	0,7
10.	IH 18	0,72
11.	IH 19	0,8
12.	IH 21	0,75
13.	IH 22	0,7
14.	IH 23	0,7
15.	IH 24	0,72
16.	IH 26	0,77
17.	IH 27	0,75
18.	IH 29	0,67
19.	IH 30	0,65
20.	IH 31	0,77
21.	IH 32	0,75
22.	IH 33	0,65

### 4. Conclusions

Based on phytochemical screening, secondary metabolites produced by all endophytic fungi isolates from vetiver contain at least one or more compounds namely terpenoids, alkaloids, steroids, saponins, phenolics and flavonoids. This phytochemical screening is strengthened by the KLT test. The KLT test results showed that the Rf value for all endophytic fungi ranged from 0.6-0.8.

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## **Potential Of Endophytic Fungi Isolates From Vetiver (*Vetiveriazizanioides* Linn) As A Biolarvacide for *Aedesaegypti* L.**

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**Abstract.** Control of vector that causes Dengue Hemorrhagic Fever (DHF) is still reliable because until now there has not been found a cure for DHF. The existence of negative impacts resulting from the use of chemical pesticides causes the need to find alternatives to larvacides that are more environmentally friendly. Larvacides that have been developed are utilizing biological larvacides (biolarvacides). One organism that has potential as a larvacide is endophytic fungi. This is based on the probability that the endophytic fungi that remain in plants have the ability to synthesize the same compounds as the host plant. Therefore, it is necessary to conduct research to determine the potential of secondary metabolites of endophytic fungi isolates from vetiver (*V. zizanioides*) as biolarvacides for *Aedesaegypti*. Secondary metabolites were extracted from pure endophytic fungi isolates (IH 8, IH 19 and IH 21). Larvicidal potential test against *A. aegypti* was carried out with a Completely Randomized Design with 3 replications. The concentrations of the crude extracts of secondary metabolites used were 2%, 4%, 8% and 16% and 0% as controls. Then the percentage of larvae, pupae and adult that died in each treatment was calculated. Observations were done for 8 days. The results showed that secondary metabolites of the three isolates have the potential to cause biolarvacidal for *A. aegypti*. The results showed that secondary metabolites of the 3 isolates had the potential as biolarvacides for *A. aegypti*. The effects include accelerating the development of larvae into pupae, causing pupae death, death of young adults and abnormal adults. The treatment with IH 08 and IH 21 at a concentration of 8% and 16%, larvae death has begun to occur on the first day.

# Correlation of Surface and Subsurface Geological Data Approach to Determine Depositional Facies of Bekasap Formation in Sungai Kuning, Rokan Hulu Riau - Indonesia

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**Abstract.** Reservoir rocks are exposed in Eastern part of the study area which one of major reservoir of oil and gas field founded in Sungai Kuning, Rokan Hulu, Riau. Surface and subsurface lithological data should be correlated to identify the connectivity because it has an impact and affects the productivity of hydrocarbons. This study focuses on the understanding of depositional facies by correlating surface and subsurface data in Central Sumatra Basin. The methods used was by obtaining surface geological data, micropaleontology and petrography laboratory analysis, characterize depositional facies and geological structure analysis. The subsurface geological data acquired from core and wireline log data of MDL-31 Well X Field, such as analysis of lithofacies, electrofacies and depositional facies. So, by the conclusion, there are four facies associations which are Distributary Mouth Bars, Tidal Channel, Upper (fluvial) - Middle Estuarine, and Lower (tidal) Estuarine Channel. From integrated analysis, reservoir lithology on surface and subsurface having similar lithological characteristics and interpreted to be deposited in same depositional environment.

## 1. Introduction

The study area located in Sungai Kuning, Rokan Hulu, Riau, Indonesia (Figure 1). Reservoir rocks are exposed in several oil fields that located in the eastern and northeastern parts of the study area. From that point, it can be interpreted that the reservoir conditions on subsurface, can be reflected the existence of outcrops which exposed on surface [1,2]. The present-day distribution of sediment and basement rocks can be related to the regional structural geology of Sumatra. The Barisan uplift and Sumatra Fault System (SFS) are controlling the distribution of rock on the mountain front [3].

Aims of this study are to correlate surface and subsurface geological data in determining depositional sequences of reservoir rocks. Also, surface data can be used as an example of rock that can be determined reservoir characteristics, especially in oil fields that have no core data. From characterizing each depositional facies that have unique physical, chemical and biological characteristics that can be distinguished from others. So, it can be used to determine the depositional environment for interpreted correlation of lithology in each layer. Even though the geological condition of the area is quite complicated, where both structural and stratigraphic conditions are affecting entrapment of oil, nevertheless, further geological approach is favorable for further exploration of oil [4].

Sequence stratigraphy is one of method of stratigraphic analysis using by both academic and industry practitioners. The interplay between base level changes and sedimentation controls the fluctuations in water depth, as well as the transgressive and regressive shifts of the shoreline [5]. Before defining boundary on each package of stratigraphy sequence, firstly, depositional facies need to define to get the fluctuating of depositional environment that affected by transgression and regression in study area. Five

systems tracts are currently in use, as defined by the interplay of base level changes and sedimentation. There are Lowstand systems tract, Transgressive systems tract, Highstand systems tract, Falling stage systems tract, and Regressive systems tract [5].



**Figure 1.** Location map of Study Area

## 2. Geological Setting

Central Sumatra Basin is one of oil and gas basin in Indonesia. The Central Sumatra Back-arc Basin is one of a series of Tertiary basins linearly arranged along the western and southern margin of the Sunda Craton of southwestern Southeast Asia [6]. From reconstruction of historical geology, the deformation was affected by the tectonic process with several phases [7]. So petroleum system generated in this area resulted from tertiary tectonic phase. The structures formed are the result of tectonic phases that formed in the study area [8].

There are a five-fold subdivision for the Cenozoic rock-stratigraphic units in the Central Sumatra Basin. The five units include (oldest to youngest), the Pematang formation, Sihapas group, and Telisa, Petani, and Minas formations [9]. The study focus on Sihapas Group, which are the main reservoir in Central Sumatra Basin. In determining age and depositional environment, microfossil analysis was performed on calcareous claystone and resulting Sihapas Formation was deposited at Early Miocene [10]. Sihapas Group divided into 4 formations which are Menggala, Bangko, Bekasap dan Duri Formations [6]. Nevertheless, four formation was not present in study location, only Bekasap and Telisa Formation that deposited that present in several spot location. The Telisa Formation deposited unconformably after Formasi Bekasap.

## 3. Data and Method

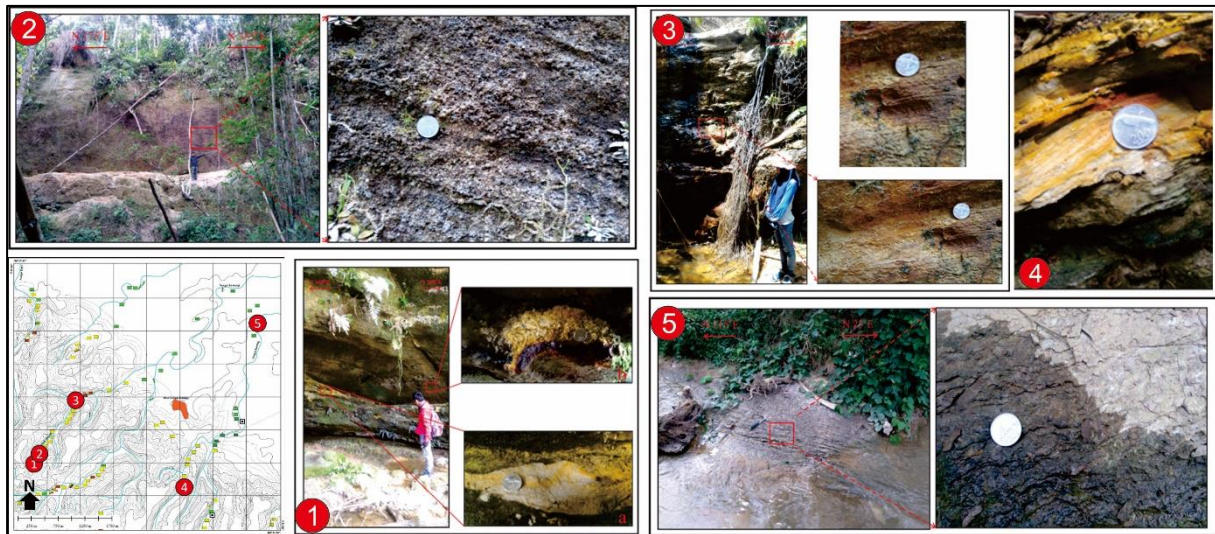
Methodology approach for this study are using several steps, firstly, collecting rock sample from field, and then conduct micropaleontology and petrography laboratory analysis [11]. Secondly, from lithostratigraphy aspect, defining stratigraphy of layer that consist in the area and naming the rock into rock unit [12] [13]. Thirdly, laboratory analysis such as grain size analysis or sieve analysis, core analysis, and facies analysis had been carried out to obtain the result. Next is correlating surface data with well core data that located 15 km northeast from Sungai Kuning area. Finally from lithological characteristics of both subsurface and surface data, facies analysis conducted to define depositional sequence on study area.

## 4. Result and Discussion

### 4.1 Field Survey Data Analysis

Based on collection data in the mapping field, three types of lithology were found, such as sandstone, sandstone gravel, siltstone (Figure 2). The sandstone description is fine - medium grain with reddish yellow (weathered) and grayish yellow (fresh), open fabric, subrounded to rounded, good sorting, hard, noncalcareous, cross-bedding sedimentary structure with ripple, parallel lamination that destructed by

bioturbation and nodules, Observation of thin rock incisions consisted of 86% quartz minerals, 10% Feldspar (A and P), 2% rock fragments, 2% opaque matrix and minerals. These rocks are grouped into fine-to-calcareous sandstones lithofacies, which deposited in distributary channel depositional facies.



**Figure 2.** Some outcrops that is founded in the study area

Gravelly sandstone also found with reddish yellow (weathered) and yellow (fresh). Grain size component mostly cobble that has 0.7 cm of average size, matrix filled with fine-medium sandstone, non-calcareous, subrounded, open fabric, poorly sorted, and slightly hard – hard. This lithology deposited erosionally with fine – med sandstone. From observation of thin section gravelly sandstone consist of 50% rock fragments, 20% sand, 28% clay and 2% opaque minerals. The rock fragments, consist of quartz, feldspar and plagioclase mineral with size 2-5 mm, subrounded – rounded, poorly sorted, open fabric also has an embayment structure in quartz. This lithology is characterized into non-calcareous gravelly sandstone lithofacies which interpreted this lithofacies deposited on Upper (fluvial) - Middle Estuarine.

Another lithology was calcareous claystone with weathered color of yellowish ash and fresh gray color, parallel lamination sedimentary structure, nodules and flakes, and hard. Observation of thin sections showed that this rock consisted of 8% quartz mineral, Feldspar and Plagioclase <2%, rock fragments <2%, clay minerals > 75% and opaque minerals <2%. These lithologies are grouped into calcareous claystone lithofacies which interpreted to be deposited in the marine environment.

#### 4.2 Core Analysis

Based on Core log model correlation on well MDL-31, there were four facies association include Distributary mouth bars, Tidal channel, Upper (fluvial) - Middle Estuarine channel, Lower (tidal) Estuarine Channel.

Distributary mouth bars consists of fine – medium bioturbated sandstone, lithofacies - bioturbation, very fine - fine calcareous sandstone, and fine-very fine sandstone with bioturbation flaser. This facies association has the characteristics of coarse up gamma-ray well log pattern and in the well log core found mud drape and flasher, and glauconite minerals with bioturbation index 3-5.

Tidal Channel consist of lithofacies calcareous fine – medium sandstone, fine –medium sandstone noncalcareous, fine calcareous sandstone, and finally fine – medium calcareous sandstone. This facies association having characteristics with bell pattern of well log and from on core are found shale rip up clast which indicates that the area are having tidally influenced, with bioturbation index 2 – 4.



Upper (fluvial) - Middle Distributary channel, consist several lithostratigraphy which are fine – medium sandstone, fine – medium no calcareous sandstone, and med to coarse noncalcareous, fine – coarse sandstone, fine to med calcareous, with structure sediment wavy lamination. This association has characteristic such as log pattern gamma ray cylindrical, med to coarse sandstone, no calcareous, and wavy sedimentary structure.

Lower (tidal) Estuarine Channel consist of consists of fine - medium carbonates, bioturbated and glauconitic fine sandstones. These facies associations are characterized by rich shell debris and glauconitic a high bioturbation index and glauconite minerals which show a large sea influence.

#### *4.3 Depositional Sequence*

In the Miocene, it beginning with decreasing sea level that caused the deposition of sandstones in distributary mouth bars and tidal channels. This deposition package was in the Tract Falling Stage System with the sub-alignment limit at the bottom and the subaerial unconformity at the top. Furthermore, sea level rise occurred but the large amount of sediment supply resulted in a progradational regression and deposition. Gravel sandstone is deposited on upper (fluvial) to middle distributary channel which is a package of Lowstand System Tract are deposited in Delta Tide dominated environment. Deposition bounded by subaerial unconformity at the bottom and maximum regressive surface or often known as Transgressive Surface.

Furthermore, the sea level continues to rise caused transgression and the depositional environment changes from the tide dominated delta into the tide-dominated estuarine. This condition resulting deposition of sandstone in the Lower Estuarine Channel continued by deposition of claystone and gradually become marine environment. Calcareous sandstone and claystone are in the Transgressive System Tract depositional package which constrains by maximum flooding surface on top.

Finally, the compression phase that caused Bukit Barisan uplifting and exposed the older rocks. So, this resulting changes in the depositional environment from the sea to the fluvial system along with the regression phase that occurs due to the compression force that happen in the study area.

#### **5. Conclusion**

Lithology correlation from surface and subsurface data showed that there are 4 facies associations, distributary mouth bars, tidal channel, upper (fluvial) - middle distributary channel deposited in Tide dominated delta. Furthermore was conformably deposition of Lower estuarine channel as the changes of regression phase into transgression, which changing the depositional condition from delta to Tide Dominated Estuarine. Deposition packages formed in the study area are the falling stage system tract (FSST), Lowstand System Tract (LST), Transgressive System Tract (TST) and Highstand System Tract. The compression phase occurred at late Miocene that resulting Bukit Barisan mountains and exposed basement rock.

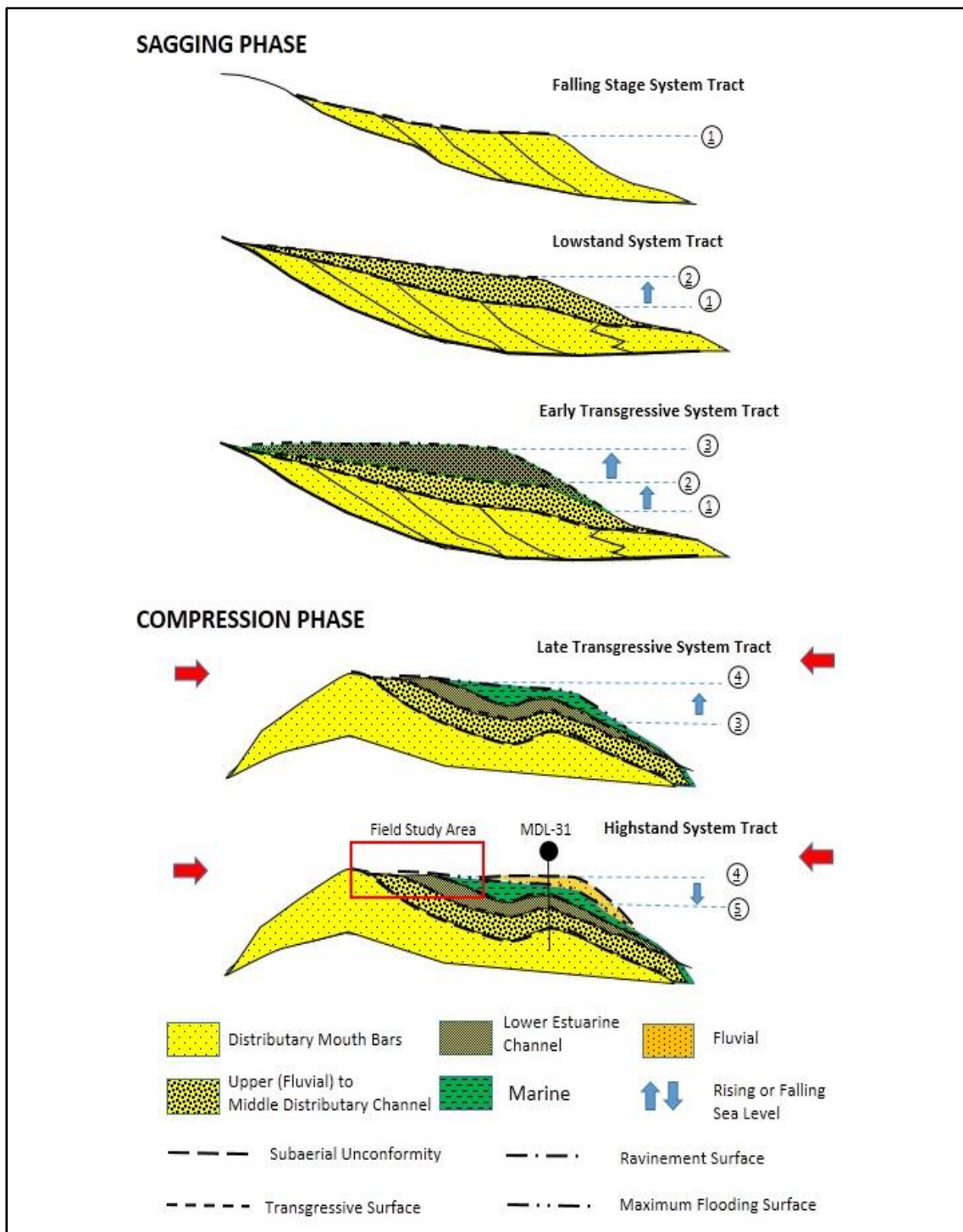


Figure 3. Depositional Sequence phases that is interpreted from surface and subsurface data analysis

## 6. Acknowledgment

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# Carbera manghas Leaf Extract as Larvacide in Controlling *Aedes aegypti*

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**Abstract.** One method to control *A. aegypti* is by using synthetic larvacide (temephos); however it can cause larval resistance. To impact and environmentally-friendly control larvae, Carbera manghas leaf extract can be used. The study assesses the effectiveness of the extract against *A. aegypti* larvae based on LC50 and LT50 to inhibit pupa growth. 20 instar larvae were used for each of 2500, 4000, 5500 and 7000 ppm concentrations with positive/negative control, 6 treatments and 4 repetitions, observed every 6 hours within 72 hours. One Way Anova and Probit Analysis were applied. The highest larval mortality was in 7000 ppm, valued at 83.75%. With Kruskal Wallis test, P-value 0.000 < 0.05. Mann-Whitney test, it is suggested that the extract affects larval mortality and inhibits the growth of pupae. The LC50 value is in 3971 ppm concentration within 72 hours. The LT50 values in 2500, 4000, 5500 and 7000 ppm concentrations are 10.8, 8.50, 7.10 and 6.11 hours respectively. 7000 ppm concentration is the highest in inhibiting pupa growth, with 69.23%. The extract can be used as natural larvacide, yet further researches on effects on human body and water purification treatments are needed.

Keywords: Carbera manghas, larvacide, *A. aegypti*

## 1. Introduction

*Aedes spp* is a vector of Dengue Fever (DD) and Dengue Hemorrhagic Fever (DHF). *Aedes spp* is spread throughout tropical countries. In Indonesia there are two species of dengue vectors, namely *Aedes aegypti* as the main vector and *Aedes albopictus* as potential vectors. Both are scattered throughout the country, except those whose height is more than 1000 m above sea level [1].

Dengue Hemorrhagic Fever (DHF) is one of the infectious diseases that the incidence is still high in Indonesia. The results show that *Aedes spp* mosquitoes are not only able to live in clear water, but can also be found in water that gets stuck and clear. With the increasing number of breeding places from *A. aegypti* mosquitoes, there needs to be more precise and effective control [1]. According to Utami [2] the most popular control nowadays is chemical control by using insecticides that work more effectively and the results are faster than biological control. However, excessive and unwise use of insecticides leads to pest resistance, pest resurgence, secondary pest explosions, inhospitable and killing of non-target organism.

*Aegypti* mosquito control which is often done so far is by fogging. According to Wahyudin [3], fogging using ordinary insecticides is not effective in eradicating dengue vector mosquitoes, because it can cause mutations that affect the resistance of *A. aegypti* mosquitoes. "So even if smoked or fogging, these mosquitoes do not die but *A. aegypti* is even immune to insecticides are sprayed. He also considered, fogging is not effective in combating the mosquito vector DHF. Judarwanto [4] explains, prevention by fumigation is actually less effective, only dispels or kills adult female mosquitoes but can not kill the larvae.

Exposure to LC<sub>50</sub> active synthetic insecticides transflutrin and d-allethrin in adult mosquitoes, will strengthen mosquitoes in the generation of filial 1 (children), which increases the fecundity rate and prolong the life of mosquitoes. The non-dead mosquitoes due to synthetic insecticidal exposure are potentially more potent and able to multiply more. Longer life of mosquitoes will increase the chance of mosquitoes to breed [5].

Besides controlling the adult mosquito, it is often done by using synthetic larvicida that is abate powder (temephos), but the use of abate powder in Indonesia from 1976 until now which has more than 30 years. It is not impossible it will cause resistance from various species of mosquitoes become a vector of disease [6]. *A. aegypti* larvae resistance report to abate has been found in several countries such as Brazil, Bolivia, Argentina, Cuba, Caribbean and Thailand according Felix in Nugroho [6]. It has also been reported resistance of *A. Aegypti* larvae to abate in Surabaya [6]. Therefore, it needs to be made another alternative that is more environmentally friendly by using natural ingredients. Plant-based insecticides are one of the greenest solutions to minimize the negative impacts caused by excessive use of non-biological insecticides. Vegetable insecticides are not too toxic so they are safe for the environment and safe for humans because the residues are easy to decompose [7].

One of plant that has the potential as a source of vegetable larvacide is bintaro plant. Bintaro is known as one of the annual crops widely used for reforestation, city decoration, medicinal plants and vegetable pesticides. This plant can be used among others as a laxative and fight cancer. All parts of bintaro plant are toxic because they contain alkaloid compounds, which are repellent and antifeedant [8]. Bintaro leaf extract contains flavonoid compounds, steroids, saponins and tannins that have toxic effects on insects [9]. There have been several studies on bintaro plants. Utami [2] reported that bintar seed methanol extract caused the highest mortality by 90% compared to fruit and leaf meat, respectively by 83.33% and 80%. The results showed that bintaro extract had a significant effect on mortality and inhibition of insect development of *Eurema* spp. Tarmadi [10] reported that skin and bintaro leaf extracts had a mortality effect on termites (*Captotermes* sp)

Research on bintaro leaf has been done by Kristiana [11] who studied the effect of bintaro leaf extract (*Cerbera odollam*) on mortality of *A. aegypti* mosquito larvae describes the effect of bintaro leaf extract on mortality of *A. aegypti* mosquito larvae. Test concentration 0.4%; 0.6%; 0.8% and 1.0% and 0% as controls with observational mortality every 24 hours for 3 days. The results showed that bintaro leaf extract significantly affected the mortality of *A. aegypti* larvae at 24, 48 or 72 hours after treatment and LC<sub>50</sub> and LC<sub>90</sub>, ie: 0.660% and 1.338% at 24 h after treatment, 0,572% and 1,130% at 48 hours after treatment, 0,439% and 0,998% at 72 hours after treatment. The optimal concentration is 1.0%. But in research conducted by Kristiana did not see the ability of bintaro leaf extract inhibited the development of larvae into pupa. Therefore we tested bintaro leaf extract as larvae *A. aegypti* larvae with concentration 2500 ppm, 4000 ppm, 5500 ppm and 7000 ppm, with observation every 6 hours for 72 hours, with the aim of research to see the effect of natural larvasida of bintaro leaf against larvae *A. aegypti* based on LC<sub>50</sub> and LT<sub>50</sub> and inhibit the development of pupa.

This study aims to see the effect of natural larvasida bintaro leaf extract on *A. aegypti* larvae mortality based on LC<sub>50</sub> and LT<sub>50</sub> and inhibit the development of larvae into pupa.

## 2. Method

### 2.1. Location and Time of Study

This research was conducted at Microbiology & Parasitology Laboratory of Health Analyst Academy (AAK) Yayasan Fajar Universitas Abdurrab Pekanbaru and Research Laboratory of Sekolah Tinggi Pharmacy Riau Pekanbaru in March - June 2017.

### 2.2. Insect Test

The population in this study is *A. aegypti* mosquito larva obtained from breeding. Maintenance of *A. aegypti* mosquitoes was performed at the Aak Fajar Microbiology & Parasitology Laboratory of AAK Fajar University Abdurrab Pekanbaru University until it reaches the initial 3 instar larvae used as test insects.

### 2.3. Plant Source Extract

Bintaro leaf used in this study was obtained in the vicinity of the environment outside the campus Binawidya Riau University Pekanbaru

### 2.4. Making bintaro Leaf Extract

For the manufacture of bintaro leaf extract taken as much as 3000 grams of leaves, washed with flowing tap water then dried in room temperature protected from direct sunlight. Bintaro leaf drying also uses an oven drying cup in the laboratory to make the bintaro leaf dry perfectly. The dried bintaro leaves are blended and then soaked with 96% ethanol until completely immersed (macerate). After 3 days, the solution was filtered with filter paper and the filter result was concentrated using Rotary Vacuum Evaporator tool until it was obtained a viscous extract with 100% concentration of bintaro leaf that was blackish. The extracts that have been obtained are stored in cabinets until they are used.

### 2.5. Testing Method

The research design was a complete random design (RAL) design with 4 concentrations of 2500 ppm, 4000 ppm, 5500 ppm and 7000 ppm and K (+) using temefos 1%, K (-) using aquades performed 4 repetitions. To get 2500 ppm concentration taken 2.5 gr bintaro leaf extract and then dissolved with 1 L aquadest. In the test execution, the diluted test solution for 2500 ppm concentration is divided into 4 parts and then put into 4 beaker glass each of 250 ml. The same is done for concentrations of 4000 ppm, 5500 ppm and 7000 ppm. At K (-) each uses 4 beaker glass of 250 ml without giving bintaro leaf extract. For K (+) put as much as 0.025 ppm temephos into 250 ml of distilled water on each beaker glass. In each beaker glass was put 20 head instar larvae 3 beginning from mosquito *A. aegypti* which still move active.

Observation of larval mortality was performed every 6 hours for 72 hours. Death data is calculated in percent mortality by the following formula:

$$\text{Persen Kematian (\%)} = \frac{\sum \text{Larva yang mati}}{\sum \text{Total Larva}} \times 100\%$$

According to Prijono (1998) in Utami (2010), extract insecticide activity is classified into several categories: (1) strong activity: mortality (m) > 95%, (2) somewhat strong: 75% < m < 95%, (3) strong enough: 60% < m < 75%, (4) moderate: 40% < m < 60%, (5) weak: 25% < m < 40%, (6) weak: 5% < m < 25% , (7) inactive: m < 5%.

The surviving larvae continue to be observed as a pupa. The percentage of success of pupa formation is calculated by using the following formula:

$$\text{Proses pembentukan pupa} = \frac{\sum \text{pupa yang terbentuk}}{\sum \text{larva yang hidup}} \times 100\%$$

### 2.6. Data analysis

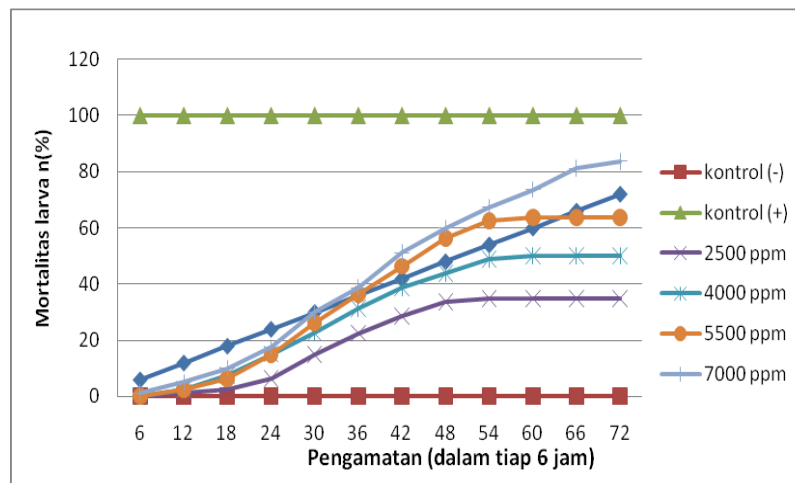
Data analysis using statistical test of variance analysis with RAL followed by one way ANOVA test. After the data is processed the one way ANOVA test can not be done because it does not meet the requirements, then the alternative test is tested Non Parametric Test Kruskal-Wallis and Whitney Man test. Probit analysis is done to see LC<sub>50</sub> and LT<sub>50</sub>.

## 3. Results and Discussion

### 3.1. Larval Mortality

The results of observation of *A. aegypti* larvae mortality process at various concentration of treatment is: early indication seen more active larvae movement by doing ups and downs, larvae that experienced the death of the body is getting smaller, thinner, and the movement is getting slower and stiffer. The number of deaths increases with increasing treatment concentration. At K (+) all larvae die during the first 6 hours and at K (-) all larvae survive. Bintaro leaf extract gave insecticide effect was slightly weaker at 35% at 2500 to slightly strong concentration at 7000 ppm concentration of 83.75%.

The results of observation on mortality percentage of *A. aegypti* larvae every 6 hours for 72 hours can be seen in figure 1 below.



**Figure 1.** Percentage mortality of *A. aegypti* larvae at various concentrations of bintaro leaf extract

Based on figure 1 above the mortality of *A. aegypti* larvae after 72 hours of observation at 2500 ppm, 4000 ppm, 5500 ppm and 7000 ppm respectively were 35%, 50%, 64% and 84% respectively. Bintaro leaf extract is able to work from 1 HSP and most effective on day 2 of HSP and then on day 3 of HSP decrease. In the Kruskal Wallis test results, it was obtained P-value 0.000 < 0.05. This score indicates that there are significant differences in mortality of *A. aegypti* larvae with different concentrations of bintaro leaf extract.

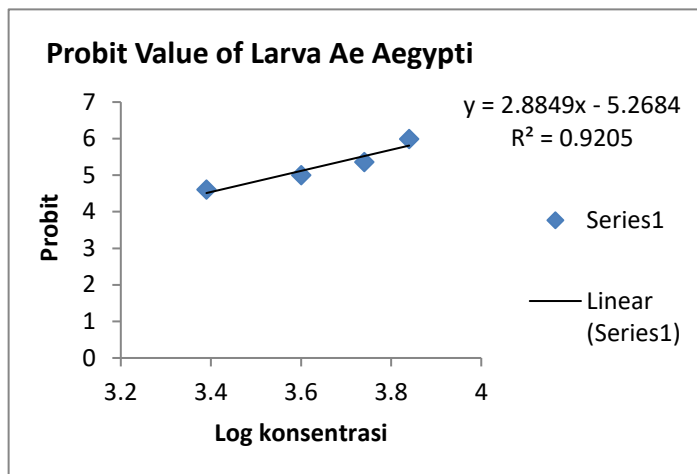
From the Mann-Whitney test results, it can be concluded that the groups that have very significant differences affecting mortality of *A. aegypti* larvae are: group K (+) with concentration of 7000 ppm with  $p = 0.001^b$ , followed by K (+) group with concentration of 4000 ppm and 5500 ppm with  $p = 0,01^b$  have real difference which influence to mortality of *A. aegypti* larvae.

In the non-Parametric correlation test, Spearman analysis obtained a Sig (2-tailed) score of 0.000 (less than 0.05), meaning there is a correlation between increasing concentration of bintaro leaf extract to mortality of *A. aegypti* larvae. Correlation strength is denoted by "strong" interpretation with a value of 0.642 \*\*.

### 3.2. Score of Lethal concentrate 50 (LC<sub>50</sub>) Bintaro leaf vegetable larvae

**Table 1.** Graph Data Probit Value Mortality Larvasida vegetable bintaro leaves Against Larva *A. Aegypti*

Concentration (ppm)	Percentage of death (%)	Concentration Log	Probit score
2500	35	3,39	4,61
4000	50	3,60	5,00
5500	64	3,74	5,36
7000	84	3,84	5,99



**Figure 2.** Graph of Probit Value of Larva *A. aegypti* Mortality Against Bintaro Leaf Extract

Based on the graph of figure 2, the probit score of bintaro vegetable larvicidal mortality on *A. aegypti* larvae can be seen clearly the increase in larval mortality from the smallest extract concentration to the largest concentration of extract. In addition, the LC<sub>50</sub> score of the mortality graph of the larvae was 3971 ppm in dedah for 72 hours. This means that the concentration of 3971 ppm of bintaro leaf extract effectively gives a mortality effect on *A. aegypti* larvae based on LC<sub>50</sub>.

### 3.3. Lethal Time 50 (LT<sub>50</sub>) value of vegetable larvacide bintaro leaf extract

**Table 2.** LT<sub>50</sub> test results

Concentration (ppm)	LT 50 (6 hours)	Interval (%)
2500	10.815	9.539 – 12.998
4000	8.503	7.628 – 9.586
5500	7.097	6.367 – 7.843
7000	6.111	5.829 – 6.400

In Table 2, the LT<sub>50</sub> test results on mortality of *A. aegypti* larvae were respectively is: at concentrations of 2500 ppm, 4000 ppm, 5500 ppm and 7000 ppm of 10,815 hours, 8,503 hours, 7,097 hours and 6,111 hours.

### 3.4. Effect of Bintaro Leaf Extract on Larva *A. aegypti* Development Become a pupa

**Table 3.** Percentage of pupa formation and inhibit the development of *A. aegypti* larvae after 72 hours of observation

No	Concentration (ppm)	Total live larvae	Total larvae become pupa (%)	Ability to inhibit the development of pupa (%)
1	2500	52	36	69,23
2	4000	40	21	52,50
3	5500	29	12	41,38
4	7000	13	4	30,77
5	K+	0	0	0
6	K-	80	80	100

Based on Table 3, the percentage of pupa formation at concentrations of 2500 ppm, 4000 ppm, 5500 ppm and 7000 ppm was 69.23%. 52.5%, 41.38% and 30.77% respectively. Ability of bintaro leaf extract inhibited the development of pupa at concentration 2500 ppm 4000 ppm, 5500 ppm and 7000 ppm



respectively were 30,77%, 47,5%, 58,62% and 69,23%. Ability to inhibit the development of the highest pupa occurred at 7000 ppm concentration of 69.3%.

Based on statistical test, on the alternative of Non Parametric Test of Kruskal Wallis, it was obtained P-value  $0.000 < 0.05$  This score means significant difference of pupa *A. aegypti* formation between group of treatment group concentration 2500 ppm, 4000 ppm, 5500 ppm 7000 ppm negative control and positive control. From Man Whitney Test, it is concluded that the groups that have very significant differences that affect the length of time of pupa *A. aegypti* formation are: positive and negative control group with  $p = 0,001^b$ ; Positive control group and concentration 2500 with  $p = 0.001^b$ ; The groups that had significant differences were the positive control group and the concentration of 5500 with  $p = 0.014^b$ .

The result of observation of *A. aegypti* larvae mortality process at various treatment concentration, based on graph in picture 1, there was an increase in larval mortality as the concentration of bintaro leaf extract increased. The higher the concentration the greater the effect of insecticide given, the higher the mortality of *A. aegypti* larvae. The results of this study are in accordance with previous research that has been done by Utami, et al. [9], that in general the concentration of bintaro leaf extract has a positive correlation with percentage mortality of *Spodoptera litura* larvae, the higher the concentration the higher the percentage of larval mortality. This is because the higher the concentration, the more toxic compounds are absorbed by the body of the larvae, both as contact poison, respiratory toxin and stomach poison so that akumulatifly faster and more toxic effect in the body of the larvae, and ultimately result in death. Susanto [12] explains that the level of larvacid toxicity to kill larvae is highly dependent on the form of larvacide, the way the compound enters the body, the concentration and amount of compounds in the body as well as the size, structure, stage and habitat of the larvae. From the results of this study, the level of toxicity gives the larvasidal effect increases with increasing concentration of bintaro leaf extract.

In addition, the length of time exposed to insecticides, it will also increase the toxicity of bintaro leaf larvae. Because the more absorbing compounds that are toxic, it will affect the body's metabolism and cause mortality in *A. aegypti* larvae. This is consistent with the results of the study of Sa'diyah, et al. [13] entitled the effect of bintaro leaf extract on the development of Grayak caterpillars, that the more absorbing compounds that are toxic from bintaro leaf extract will affect the caterpillar's metabolism and will cause death.

The process of death of *A. aegypti* larvae at various treatment concentrations: a). The larvae that die of the body look stiff, this is because the flavonoids contained in bintaro leaves can cause the loss of chitin and abnormal stretching of the larvae, which enter the mouth and the respiratory tract / spiracles. This study is in line with the study of Gautam [14] in *Anopheles* and *A. aegypti* larvae given Vitex negundo plant extracts containing flavonoids showing integral disintegration features associated with loss of chitin and abnormal stretching of the larval body. This is due to the neurotoxic effects of Vitex negundo plant extract containing flavonoids. Utami [9] explains that flavonoids in bintaro leaves have an effect on mortality of *S litura* larvae. Flavonoid compounds are a group of the largest phenol compounds found in nature that contain toxic, antimicrobial / protective effects of plants from pathogens and antifeedants. Hollingworth in Utami [9] rotenon is a flavonoid group compound that has a lethal effect on insects. He thinks the rotenon acts as a cellular respiratory toxin, which inhibits electron transfer in NADH-coenzyme ubiquinone reductase (complex 1) of the transfer electron system in the mitochondria.

In the process of death of *A. aegypti* larvae: b). It can be seen body of the larvae getting smaller, thinner and the movement slowed down and eventually died. Saponins contained in bintaro leaf are known to be highly toxic to *A. aegypti* larvae and it can inhibit larval eating activity. Because of damage to the cell membrane of the gastrointestinal tract and it will affect the absorption of food that is likely to cause the body of the larvae to shrink and the movement progressively slow down so that it affects the mortality of larvae. Chaieb [15] reported that saponin compounds can be insecticidal by altering their eating behavior by inhibiting food (uptake) in the gastrointestinal tract and inhibiting larval stage growth by interfering with the larval molting stage. Furthermore adds that saponins can be larvicidal by

lowering the surface tension of the mucous membrane tractus digestifus larvae so that the tract wall becomes corrosive [16]. Kristiana [11] describes the consequences of cell damage is allowing the transfer of vital components of the cell to the outlet or vice versa, thus it will affect cell metabolism.

The ability of bintaro leaf extract inhibited the development of pupa at concentration 2500 ppm 4000 ppm, 5500 ppm and 7000 ppm were 30,77%, 47,5%, 58,62% and 69,23%. The higher concentration of bintaro leaf extract the less pupa formed and the higher the ability to inhibit the development of larvae into pupa and the longer time it takes to turn into pupa [2]. This is because bintaro leaves also contain saponins and tannins.

In addition to saponins contained bintaro leaf extract also contained tannins. Tanin also affects the mortality of *A. aegypti* larvae, as it also interferes with the digestive system of larvae in the absorption of foodstuffs which results in the body of the larvae is getting smaller and thinner. The reduced percentage of larvae to pupae at high concentrations due to the content of bioactive compounds contained in bintaro leaf extract can inhibit the growth of larvae, such as saponin and tannin compounds. Yunita [17] explains that tannins may interfere with insects in the digestive process of food because tannins will bind proteins in the digestive system that insects need for growth so that the process of protein absorption in the digestive system becomes disrupted. The same thing, according to Hopkins and Hiiner in Yunita [17] that tannin suppresses eating intake, growth rate and survival ability. Tannins, saponins and quinones have a bitter taste that can cause a feeding mechanism in the test larvae, and the larvae will not eat, it will starve and die eventually. This research is similar to the research [2] that the compounds in bintaro are strongly suspected to have a significant effect on the mortality of *Eurema* larvae. Besides causing mortality, it also has a significant effect on the inhibition of growth and the success of pupa formation.

According to research, bioactive compounds that enter through the digestive system will disrupt the physiological process of Grayak caterpillars, which disturb the working system of enzymes and hormones [13]. Ekdison hormone triggers skin turnover and if there is interference which will disrupt the process of development in insects. The compound disrupts the ecstasy process is saponin. Saponins can bind sterols in the food ducts so that there is a decrease in the rate of sterols in hemolimfa. Sterol acts as a precursor (stimulant) for the formation of ekdison hormone. The decrease of sterol supply, then th skin change will also be disrupted, there is disruption to the growth and development.

In addition to saponin,the bintaro leaf also contains steroid. steroid has toxic effects and inhibit the development of insects. According to Kristiana [11] steroid compounds will affect the central nerves system produce and secrete the eco-hormones and juvenil hormones responsible for the larval skin replacement.If there is no steroid in hemolymph then the larvae will not change skin. Yunita [17] explains that steroids can inhibit the development of *A. aegypti* mosquitoes. Besides steroids contained in plants have protective functions, such as photoecdison so that steroids can inhibit the process of skin turnover in insects.

Based on  $LC_{50}$  obtained at 3971 ppm within 72 hours, this means that the concentration of 3971 ppm of bintaro leaf extract effectively gives a 50% mortality effect on *A.aegypti* larvae. The bioactive compound in bintaro leaf extract is the cause of larval death because it can act as toxicant. The death of the larvae is due to the inability of the larva to detoxify the toxic compound that enters the body of the larvae. The  $LC_{50}$  score in this study were lower than those of with concentrations of 0.4% (4000 ppm), 0.6% (6000 ppm), 0.8% (8000 ppm) and 1 % (10000 ppm) and observation of *A.aegypti* larvae mortality performed every 24 hours, 48 hours and 72 hours. From the  $LC_{50}$  results observed after 24 hours, 48 hours and 72 consecutive hours were 6600 ppm, 5720 ppm and 5390 ppm and the optimal concentration of bintaro leaf extract was 10000 ppm [11].

In  $LT_{50}$  test results at the highest concentration (7000 ppm) it takes 6.11 hours to get 50% mortality of larvae. This is because the greater the concentration of bintaro leaf extract given to *A. aegypti* larvae the faster the time it takes to kill the larvae.

The utilization of bintaro leaf extract in this study at low concentrations as larvae of *A. aegypti* mosquito can be used because it causes mortality and inhibits the development of larvae into pupa. From the results of this study allegedly bintaro leaf extract (*Carbera manghas*) can be used as a vegetable larvacide in the community, because bintaro leaf is also used as a laxative and fight cancer. Which means bintaro leaves in low concentrations are suspected to have a low toxic risk to humans so it will not affect the body. This opinion is based on Rohimatun's opinion [8], that young leaves of bintaro have efficacy as soft laxative, which for Ambon tribe of young leaves is cooked as vegetable. In addition, bintaro leaf methanol containing 17 Beta H-neerifolin can fight breast and ovarian cancer cells, so it is potentially for further development.

However, it is suspected that bintaro leaf extract can be utilized as a vegetable larvicide, it is necessary to further test to the extent of its effect on the human body, as one of the requirements of a plant-based insecticide is relatively safe for humans and animals as well as for the environment. Besides, based on LC<sub>50</sub> of 3971 ppm, the concentration is still very high when compared with the use of abate powder (temephos). At the time of implementation of this study the use of bintaro leaf extract affects the water color, so the water is not clear. This needs further testing of the eff that can be done so that the water can be clear, because one of the water conditions that can be used is not colored.

In terms of quantity, bintaro leaves abundantly compared to the fruit and bark of the stem, making it is easy to be obtained. Utami [2] explains, in the utilization of plants that have potential as insecticides / vegetable larvasida, there are several things to note that is: 1). Plants that are potential as bioactive insecticides are easily available in nature and are ubiquitous, 2). Biomass can be obtained in abundance, 3). Easy to decompose in nature so as not to pollute the environment and relatively safe for humans and pets because the residue is easily lost. Therefore, in terms of the number of parts of bintaro leaves can be used as a vegetable insecticide in *A aegypti* mosquito considering the leaves are abundant compared to the fruit and bark.

#### 4. Conclusions

Bintaro leaf extract had a significant effect on larval mortality and it inhibited the development of pupa. LC<sub>50</sub> 3971 ppm for 72 hours. LT<sub>50</sub> at 2500 ppm, 4000 ppm, 5500 ppm and 7000 ppm of 10.82 hours, 8.50 hours, 7.10 hours and 6.11 hours. Ability to inhibit the development of the highest pupa at 7000 ppm concentration of 69.23%. Bintaro leaf extract can be used as a vegetable larvacide. However it is necessary to test its effect on the human body and the purification efforts of water.

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# Compressive Strength and Workability of Normal Concrete Mixed Beton Mix With and Without Water Reduction

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**Abstract.** The problems of uncontrolled water use in the application of additive use as an additive have been significant impact on the strength of concrete and the workability. This paper describes an experimental study of the use of additives, Beton mix, as additive to normal concrete with certain level. Specimens have been made without reduced of water and also by reduced of water. This study focuses on the workability and also the compressive strength of specimens. The results of the compressive strength test at 28 days, showed that the specimens without reduce of water increased for specimens with composition of Beton mix 0.15%, but the specimens that use less 0.15% showed decreased the strength of the concrete linearly. In additional, the slump also increased. In contrast to the specimens by reduced of water, a slump showed decreased with a maximum reduction limit of 20%, and the strength of concrete showed an increase of 5%.

Keywords: concrete, beton mix, slump, compressive strength

## 1. Introduction

Concrete material is the most widely used material by structural experts to use as building material. This is because the mixture of concrete material is easy to obtain naturally in many places. Furthermore, in terms of implementation of the construction is easy to create and implemented. The more intense the use of concrete materials, demanded to be better in terms of performance and cost, this is evidenced by the many studies conducted to determine the strength and weakness of concrete materials, particularly the main material compilers (cement, water, coarse and fine aggregate) as well as additives on the concrete.

Devo. J. S, (2015), admixture is used on concrete to change some properties of cement. This material refers to a substance added at the stage of the preparation or the mixing of the concrete. Nowadays, the use of Superplasticizer increases more than other chemical mixtures. The use of additives to improve the quality of concrete must consider the availability in the market, not all additives available on the market, such as Bengkalis, additive available there are two namely Sikacim and Betonmix that has a superplasticizer.

The use of additives already has rules written on the brochure, but not all consumers follow the rules, so this causes the problem of uncontrolled use of water on the implementation of the use of additives. Consequently, it has a significant impact on the strength of concrete and the workability. Therefore, in an experimental study of the use of additives, Beton mix, as a normal concrete forming material with a certain level, which is applied to the condition with and without reducing of water.

## 2. Materials and Methods

### 2.1 Materials

The concrete forming materials used in this study consist of Portland cement type I, coarse and fine aggregate from TanjungBalaiKarimun, water and additives of Beton Mix products. Specification of Beton Mix according to product rule that 1kg for 2-8 sack of cement (1 sack of cement = 50 kg). The

use of Beton Mix in mixing process is by mixing the additive and water that used, then put into a mixture of cement, coarse and fine aggregate that has been mixed for  $\pm 3$  minutes.

The fine aggregate or sand used was an aggregate with a particle size of less than 4.75 mm but more than 75  $\mu\text{m}$  (mesh size No. 200). The coarse aggregate used was an aggregate with a particle size of more than 4.75 mm but less than 40 mm. The material properties can be seen in Table 1.

**Table 1.** The results of coarse and fine aggregate properties

Characteristics	Coarse	Sand
Water absorption	0.38%	0.6 %
Specific gravity(SSD)	2.60	2.62
Weight volume	1544.37 kg/m <sup>3</sup>	1668.86 kg/m <sup>3</sup>
Water content	0.27 %	1.27 %
Organic content	Normal	Normal
Abrasion test	39%	-
Mud level	< 1%	< 3.5%
Fine modulus	7.173	2.943



**Figure 1.** Figure Beton Mix.

## 2.2. Methods

The planned concrete materials are  $f_c'$  20 MPa, 25 MPa, 30 MPa and 35 MPa with w/c plans respectively 0.55, 0.50, 0.45, 0.42. The use of Beton Mix additives of 0%, 0.15%, 0.25%, 0.50% and 0.75% of the weight of Portland cement without reducing of water. As a comparison, was prepared a sample of 1% of Beton Mix by water reduction 0%, 10%, 20% and 30% with strength plans 20 MPa. Testing of compressive strength was done at age 28 day by cylinder test object diameter 15 cm and height 30 cm accordance of SNI 03-1974-1990. The weight of concrete volume test was done simultaneously with concrete compressive strength test. The composition of the material used refers to the SNI 03-2834-2000 which was evaluated due to the use of the additive, the composition of the material when 0% of the additive of the aggregate conditions of the saturated surface dry (SSD) can be seen in Table 2. The level of Beton Mix was obtained by taking the percentage of additive to weight of cement according to the quality of the concrete, while the water reduction was obtained by taking the percentage of water reduction to the total of water requirement on the  $f_c$  20 MPa.

**Table 2.** Proportion of 1 m<sup>3</sup> of concrete 0% additives with slump 10 ± 2 cm

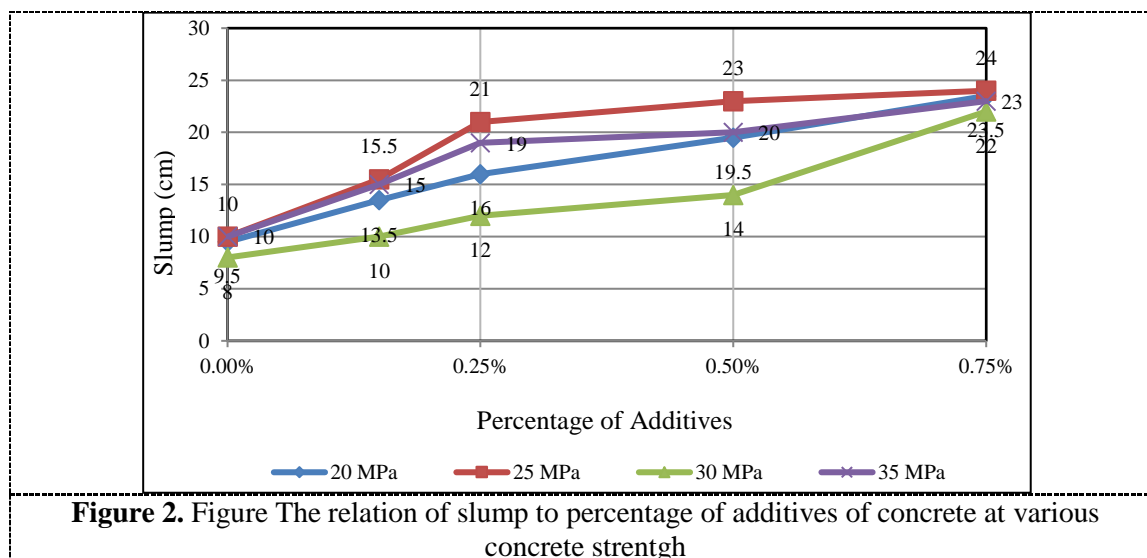
Concrete compressive strength, fc' (MPa)	Cement (kg)	Sand (kg)	Coarse (kg)	Water (kg)
20	336.60	675.12	1174.52	185
25	370.00	653.04	1160.96	185
30	411.11	629.38	1143.50	185
35	440.00	612.00	1137.00	185

During the process of mixing in a concrete mixer it was observed that the level of workability of fresh concrete was expressed by slump. Slump testing was performed by using a device shaped cone with procedure referring to SNI 03-1972-1990. After obtaining the slump as planned, then further put fresh concrete into the cylinder mold as much as three layers up to full. Each layer was compacted by being impact on the outside of cylinder mold using a rubber hammer. The curing of the specimen started after the fresh concrete was put on the cylinder mold, i.e. by closing the surface of fresh concrete that was directly related to the environment using plastic to prevent excessive evaporation. After 24 hours the mold was opened, the next curing was to put the sample into the water. The process of weight volume test and compressive strength of concrete was done in the Materials Testing of Laboratory, Civil Engineering Department Politeknik Negeri Bengkalis. The test was done after the concrete test sample reaches the determined age. The compressive strength of the concrete was obtained by the Compression Testing Machine (CTM).

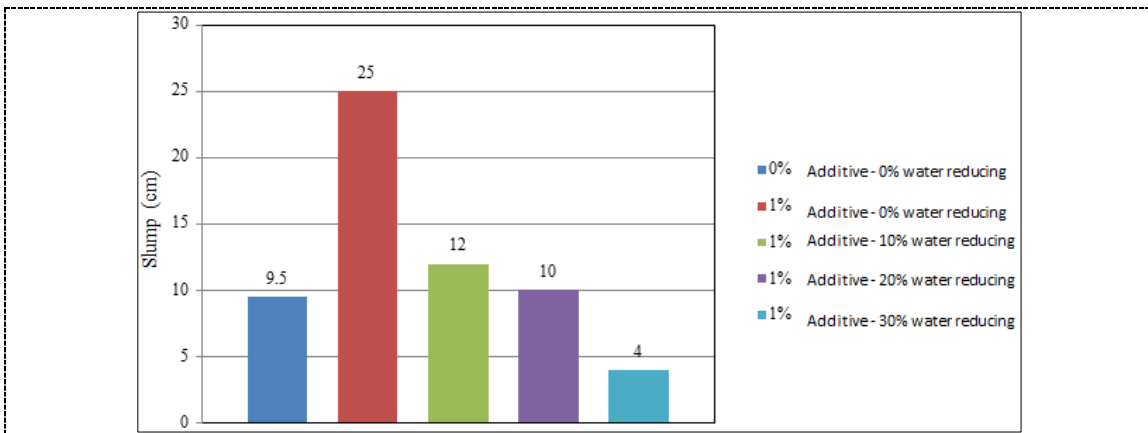
### 3. Results and Discussion

#### 3.1. Results

The slump was required to know the level of workability of concrete. The lower slump indicates that the concrete was low level of workability. The slump test results can be seen in Figure 2 and Figure 3.



**Figure 2.** Figure The relation of slump to percentage of additives of concrete at various concrete strength



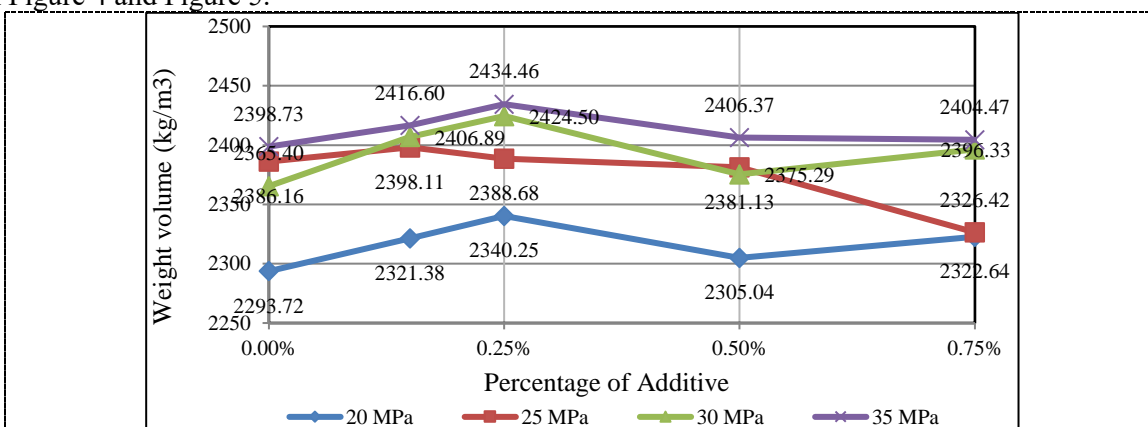
**Figure 3.** Figure The relation of slump to variation of water on the concrete strength  $f_c'20$  MPa

Figure 2 shows, the sample without water reduction, it was found that the higher percentage of Beton Mix used will increase the slump. This was seen in concrete without Beton Mix (0% additive) slump obtained by 8 cm to 10 cm. Furthermore, in sample with the additive percentage of 0.15%, 0.25%, 0.50% and 0.75% there was a rise in slump. This was different if the concrete was done in the sample with reduction of water, such as  $f_c' 20$  MPa with 1% Beton Mix addition decreased slump along with the water reduction percentage increase, as shown in Figure 3. The reduction of water can be done at a percentage of 20%. In contrast, on percentage 30% of water reduction the concrete will have low level of workability, where the slump obtained 4 cm.

Shah (2014), using the ASTM method, the addition of superplasticizer additives at 0%, 0.5%, 1.0%, 1.5% and 2.0% in  $f_c'20$  MPa, with target slump of 1cm to 3 cm, obtained slump of 2 cm, 10 cm, 17 cm, 22 cm, and 25 cm. The addition of superplasticizer additive can increase the slump. Similarly, Salahaldeen (2015) adds additive brand Liboment-163 at 0%, 0.6%, 0.8%, 1.2%, 1.8% and 2.5% of  $f_c' 30$  MPa, with 6 cm target slump obtained each slump of 6.5 cm, 7 cm, 9.5 cm, 12.5 cm, 13 cm and 14 cm. The increase of concrete workability was due to the characteristic of the superplasticizerto push out the water that bound to the cement particle group, to produce viscosity of cement paste or fresh concrete to be lower[5].

### 3.2. Weight volume

The data of weight volume test for various additives of concrete to the strength of concrete was shown in Figure 4 and Figure 5.



**Figure 4.** Figure The Relation of weight volume to percentage of BetonMix on the various concrete strength



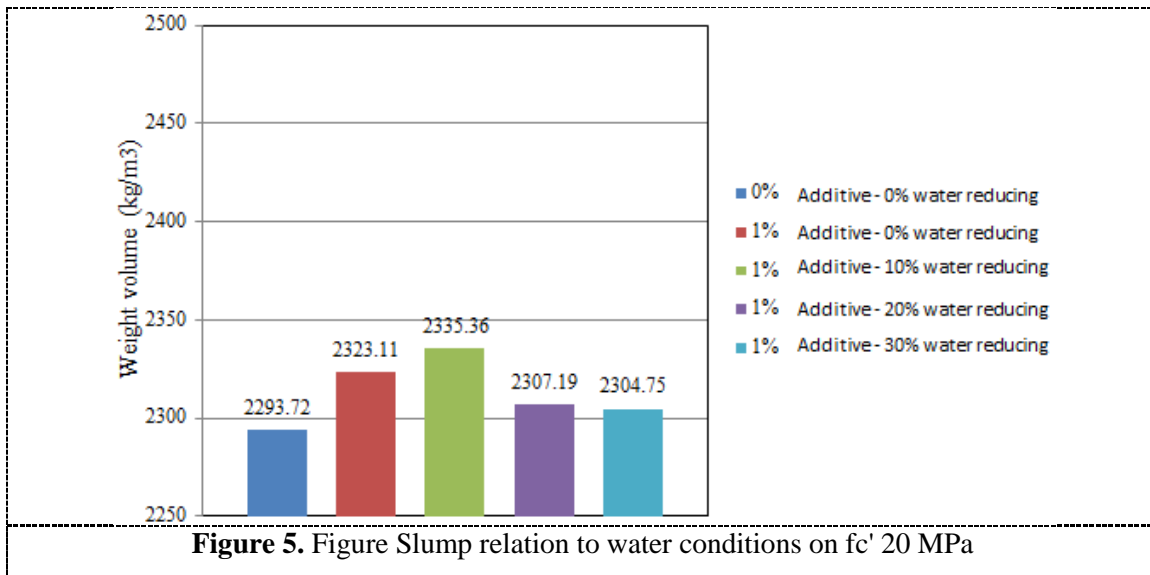
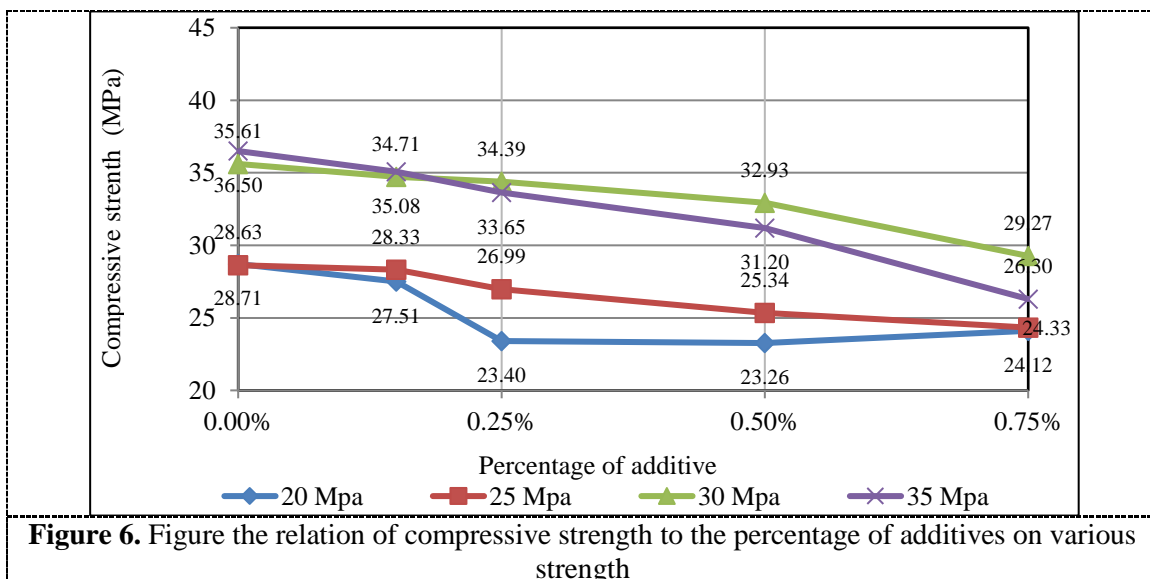


Figure 4 shows, the weight of concrete volume with additive of Beton Mix at certain percentage for various strength of concrete with or without water reduction was in the range 2293 - 2435 kg/m<sup>3</sup>. For concrete with strength of 20 MPa, 30 MPa, and 35 MPa, maximum weight of volume occurred in addition of 0.25% additives, while for 25 MPa maximum weight content at additive of 0.15%. In concrete strength  $f_c'$  20 MPa with water reduction, the maximum of weight volume was on the percentage of additive 1% with a water reduction of 10%.

### 3.3. Compressive strength

The results of compressive strength at 28 days are shown in figure 6 and figure 7.



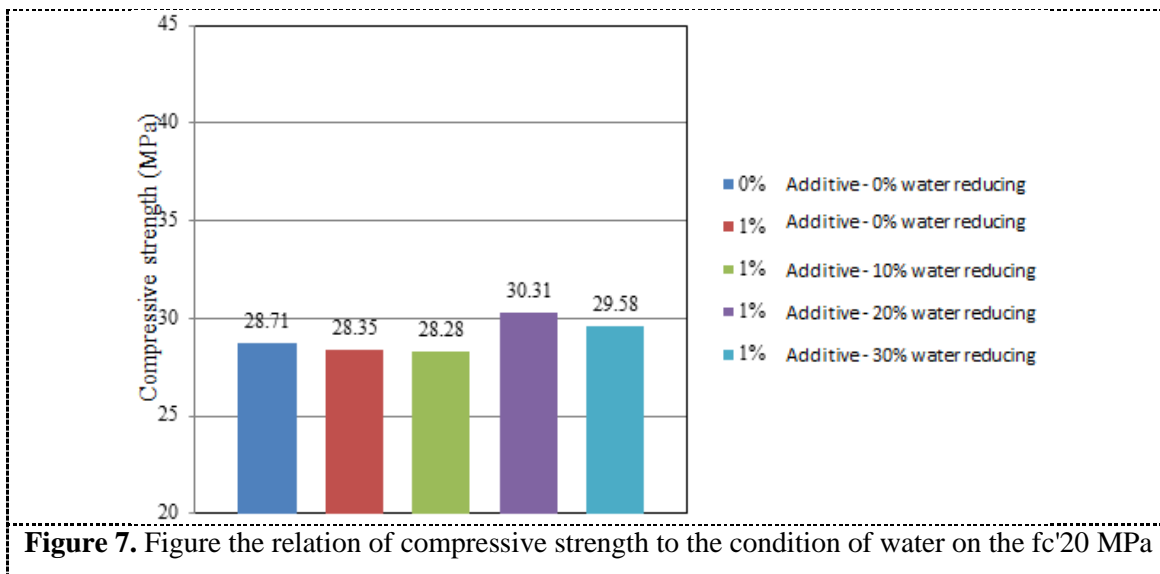


Figure 6 shows that compressive strength of concrete with and without additive for sample without water reduction. The compressive strength of concrete has decreased as the percentage of additive of Beton mix was increased. This can be seen on the slope or gradient of the concrete curve containing the additive of the Beton Mix. For all concrete strength (20 MPa, 25 MPa, 30 MPa and 35 MPa) on additive of Beton Mix 0.15% decline below 5%. The decrease exceeds 15% occurs in over 0.15% use of Beton Mix for  $f_c' 20$  MPa, and 0.75% Beton mix for 25 MPa, 30 MPa and 35 MPa, therefore the use of concrete additive mix 0.75% without water reduction cannot fulfill the requirements of  $0.85f_c'$ .

Salahaldein, (2015) addition of Liboment-163 with percentage 0%, 0.6%, 0.8%, 1.2%, 1.8% and 2.5% in  $f_c' 30$  MPa, a maximum increase of compressive strength occurs in the use of 0.8% of Liboment-163, whereas in the use of Liboment  $> 0.8\%$  there was decreased in the strength of concrete.

Lateef, (2016), the use of the superplasticizer type ISOPLAS SP-530, with percentage 0%, 0.5%, 1%, 1.5% and 2% on the  $f_c' 30$  MPa, the test results show that the effect of adding additives to the concrete depends on the dose. Optimum compressive strength was generated at a percentage of 1.5% of ISOPLAS SP-530.

On the other hand, different results are shown in Figure 7, for samples with water reduction on the use of 1% Beton Mix for  $f_c' 20$  MPa. The decrease occurred in the water reduction of 10% by 1.52%, while in the water reduction of 20% and 30% there was a strength of concrete increase of 5.56% and 3.03% respectively. It can be concluded that 20% water reduction was very effective on 1% Beton Mix.

This was due to the reduction of water so that the water cement ratio which was the main factor determining the strength of the concrete can be minimized as small as possible, so that only water was needed for the cement hydration reaction used [5].

#### 4. Conclusions

The slump of concrete has increased in the sample without water reduction for the use of Beton Mix. These results are inversely to the use of Beton Mix by reducing of water, the slump obtained decreases, with a maximum reduction limit of 20%, where a reduction of 30% water reduction produces the fresh concrete with low workability levels. The use of Beton Mix on a normal concrete with a compressive strength at 28 days, without reducing of water shows that concrete strength decreased by  $<5\%$  in Beton Mix 0.15%, but use of above 0.15% decreased concrete compressive strength linear, where a decreased  $>15\%$  occurs in use above 0.15% for  $f_c' 20$  MPa and 0.75% for  $f_c' 25$  MPa, 30 MPa and 35 MPa.

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# The Experimental Study On Laminated Beam By Mahang And Meranti Wood With Variations Connectors

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**Abstract.** Laminated of Mahang and Meranti wood were the efforts to improve the efficiency of hardwood (Meranti) and light wood (Mahang), so that to be used for structural timber. Variant of connectors were expected to increase laminate beam capacity compared to solid beams. Samples have been made include properties material samples and laminated beam samples with dimension 76 x 5 x 5 cm. Beam samples were 3 types of connector i.e. glues, nails and bolts. The capacity was obtained by provided one point load at the center of span. In addition to load force, deflection were also recorded which then analyzed the flexural capacity, MOR and MOE. The result showed that at the limit deflection, the glue laminated beam (BL LM) has a higher average capacity than the bolt laminated beam (BT BL) and the nail laminated beam (BL PK). In contrast, at the ultimate conditions, BL PK has a higher capacity rather than the others. At the same time, BL LM has a higher average of MOE of 6818.88 MPa and BL PK has average of MOR 3 times larger than Meranti solid beam (BL ME).

## 1. Introduction

Currently the use of wood in the construction industry is growing rapidly, this is because wood is still the choice of society as a substitute for other materials that are still lacking. Wood commonly used to build and renovate the house, fulfill the needs furniture and meet the needs of wood processing industry. Moreover, it also attracted researchers to develop the technology of utilizing light wood become laminated beams.

Laminate beams are one of the engineering products created to improve the quality of structural wood as well as completing the needs of ideal dimensions particularly for long spans. In the process of laminated beams, the preparation of each layer with connector can be modified so as to improve the strength of properties wood.

Mahang wood is a light type of wood with a density ranging 270-500 kg/m<sup>3</sup> at a moisture content of 15%. The round shape, smooth, diameter can reach 70 cm, specific gravity (BJ) 0.45, durability class V and strength class III. This wood has a growing age shorter when compared with other wood. In area, particularly Bengkalis district, the use of this wood limited to non-structural.

Meranti Merah classified as hardwood with light to medium weight wood. This wood has specific gravity from 0.3 to 0.86 at a moisture content of 15%. Generally pink or bronze with durability class III-IV. This wood has not so resistant to the effects of the weather, so that not recommended for outdoor or directly contact with the soil. However, this wood is easily preserved with a mixture of diesel oil called creosote.

This research tries to utilize Mahang wood as light wood to be combined with Meranti wood as heavy wood to be laminate beam, so that the utilization of Mahang wood can be more economical and have higher selling value. This research funded by PNPB Politeknik Negeri Bengkalis in 2017.

The main purpose of this research is to know the capacity of laminated wood of Meranti Merah combined with Mahang wood. In addition, to determine the modulus of elasticity (MOE) and modulus of rupture (MOR) of the wood laminate beam.

## 2. Literature Review

### 2.1. Laminate

According to SNI 7973-2013, laminate beam (glued laminated timber) is a strength-separating product from a wood-laminated factory, including assembly of specially sorted and specially prepared laminated wood and combined with adhesive. All of laminate layer is approximately parallel in the longitudinal direction. The net thickness of each lamina does not exceed 50 mm and consists of:

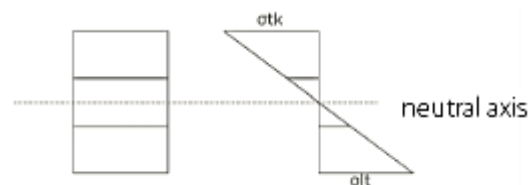
1. One lamina
2. Lamina-lamina are put together end to end to form a certain length
3. Lamina-lamina that placed or glued side to the side to form a certain width
4. Lamina-lamina is bent during the adhesive process to obtain a curved shape.

Lamination technology is a technique of combining materials with adhesive, small building materials can be glued to form components of the material as needed. Lamination techniques are also a way of combining non-uniform materials or various qualities (Gunawan, 2007). For example, low quality wood combined with high quality wood is designed with the distribution of load type to the product. Thus the lamination technique is a technique of combining that highly efficient to produce effective building material products.

Factors to be observed when making laminate beams are as follows:

1. Types of adhesives used in laminate
2. The number of adhesives used for combined each layer
3. The type of wood used in the laminate
4. Connection type and position used in connection of laminate
5. Material size with weak point (failure) bending or shear.

For the purpose of improving the quality of Mahang wood on the laminate beam is used a cross section based on the concept of the beam stress as shown in Figure 1.



**Figure 1.** Bending stress distribution

At the top of the diagram shown maximum compressive stress due to a bending load on the laminate beam, on the other hand at the bottom it has the maximum tensile stress. Furthermore, in the middle (neutral axis) does not seen compressive stress or tensile. Because the closer the neutral axis the smaller the strength, then on that part does not need to use a type of wood that has the strength or high quality. In other words, high quality wood is placed on the outer side of the laminate beam.

### 2.2. Gluing

The adhesion is defined as a condition where the surface is put together by inter-surface forces which consists of the the valence force (interlocking action). The adhesive functions as a combination between two bonded substrates. The strength of the gluing is influenced by several factors such as the nature of the adhesive and the compatibility or suitability between the material that will glue and the adhesive (Oka, 2005).

According to Handayani (2009) in Pramudito J (2013), epoxy glue is a thermoset synthetic product of poloeoposi resins with curing agents (acids / bases). Glue epoxy can be obtained in the form of one or two component systems. The one-component system includes liquid resin-free solvents, solution, resin pastes, liquids, powders, pallets and pastes. The two-component system consists of resin and curing agent mixed at the time of use, then immediately used for gluing.

Furthermore, Handayani (2009) in Pramudito J (2013) stated that epoxy glue also has advantages and disadvantages. The advantages remain unchanged despite being stored for years, resistant to oil, alkali, aromatic solvents, acids, alcohols, as well as heat and cold weather. While the deficiency is weak to ketones and esters, there is also a formulation not resistant to oil. In addition, epoxy glue will be damaged if the mixture is exposed to water for long periods. In the polomina and anhydride systems cannot stand at cold temperatures or frozen.

### 2.3. Modulus of Rupture (MOR)

The flexural strength often referred to as the Modulus of Rupture (MOR) determines the external load capacity capable of being retained by a beam.

Iensufrie (2009: 14) states, wood flexibility is the ability of wood to bend when holding the pressure on it. According to Dumanauw (1984: 24) said that the ability of bending is the ability to resist forces that will bend wood or to resist dead and living loads. The load mean is other than the blow load that should be retained by the wood, for example "blandar". This value is calculated using eqs (1), the following:

$$MOR = \frac{3.P.L}{2.b.h^2} \quad (1)$$

P is the load (kg), L is the length of the beam testing span (cm),  $\Delta$  is the deflection (cm), b is the width (cm), and h is the beam height (cm).

### 2.4. Modulus of Elasticity (MOE)

The elastic modulus is a measure of extension when a wooden beam is pulled, shortening when a wooden beam is subjected to pressure during loading with a constant loading speed.

The Elasticity Modulus (MOE) describes resistance to bending, which is directly related to stiffness (Akhtari et al., 2012). This value is calculated by using eqs (2), with P is load (kg), L is span of beam testing (cm),  $\Delta$ : deflection (cm), b: width (cm), h: height (cm).

$$MOE = \frac{PL^3}{4 \Delta b h^3} \quad (2)$$

In this research used the reference Indonesia Standard particularly about Procedure Planning Wood Construction to determine the mechanical strength. The following table of reference strengths is based on the mechanical sorting according to SNI 7973-2013. For the classification of wide-leaved laminate beams can be seen in Table 5B and for solid beam classification can be seen in Table 4.2.1 in SNI 7973-2013.

### 2.5. Reference strength

Sorting visually follows the standard visual sorting basic standard. The strong value of the wood mechanical reference can be seen in Table 2.2 based on the reference flexural elasticity modulus value (Ew). For the results of the laboratory test the strongest reference value can be calculated using the eqs (3).

$$F = \frac{F_{Avg} - (1,645 .STD)}{\gamma_{DL}} \gamma_{KA} \quad (3)$$

With  $F_{Avg}$  is average, STD : deviation standard,  $\gamma_{DL}$  is time load factor,  $\gamma_{KA}$  is correction factor of water content.

Time load factor correction ( $\gamma_{DL}$ ) account time-dependent behavior of wood. Wood gives high strength for short time loading and so the opposite. This correction factor is 1 for loading duration of 10 years. As for laboratory testing with duration of loading about 3 to 5 minutes, the correction factor is 1.65. The water content correction factor is considered to be equivalent to 1.0 for wood that have the average moisture content ranges from 12% to 15% (Awaludin Ali, 2011).

## 3. Research Methods

This research was experimental in the laboratory which then the result was analyzed using the existing equation. The materials used are Mahang and Meranti wood obtained from the Bengkalis island Riau

Province. Adhesives used there are 3 types i.e. epoxy glue Brand Qbond, bolt diameter 12 mm length 6 cm and 2 inch nail. Test specimens made for testing the properties of materials and laminated beam with different variations. The five specimens were used for property testing and 5 to 6 laminated beam specimens of each variation. Variations of laminated beams made of glue adhesive laminated beam (BL LM), laminated beam with spacing of nail 5 cm (BL PK) and laminated beam with 5 cm spacing of bolt (BL BT). Testing the material properties include moisture content, wood density, compressive strength parallel and perpendicular, shear strength, tensile strength. Furthermore, bending test of laminate beam has been done by giving one point load in the middle of the span with the distance of support 71 cm referring to SNI 03-3959-1995. The results obtained are the load and deflection that occur in the conditions allowed and the maximum conditions which will then be analyzed to determine the value of capacity, MOR and MOE.



Figure 2. setting up of specimen testing

#### 4. Results And Discussion

Testing the material properties is done first to ensure that Mahang wood does have a lower quality of Meranti wood. The result of the material properties test was calculated average and the standard deviation from each sample, then determined the reference strength based on the eqs (3).

##### 4.1. Properties materials of Mahang wood

The results of Mahang wood properties testing have been done in the form of physical and mechanical properties. The result can be seen on Table 1.

Table 1. Result of Mahang wood properties test

	Average (MPa)	Mahang wood	
		Standard deviation	Reference strength (MPa)
Moisture content		15.20	
Density		0.30	
Compressive strength parallel	23.27	1.14	12.97
Compressive strength perpendicular	5.41	0.99	2.29
Shear strength	2.15	0.05	1.25
Tensile strength	74.10	9.64	35.30
Bending Strength MOR	48.87	3.33	26.30
MOE		5141.09	

Tabel 1 shows that at a moisture content of 15.2%, the bending strength was 26.3 MPa, tensile strength of 35.3 MPa and MOE of 5141.09 MPa. These results indicate that this wood was on grade E5 based on SNI 7973 2013 classification.

##### 4.2. Properties materials of Meranti wood

Meranti wood testing was similar to the tests that have been done on Mahang wood. The result of Meranti wood properties can be seen on Table 2.

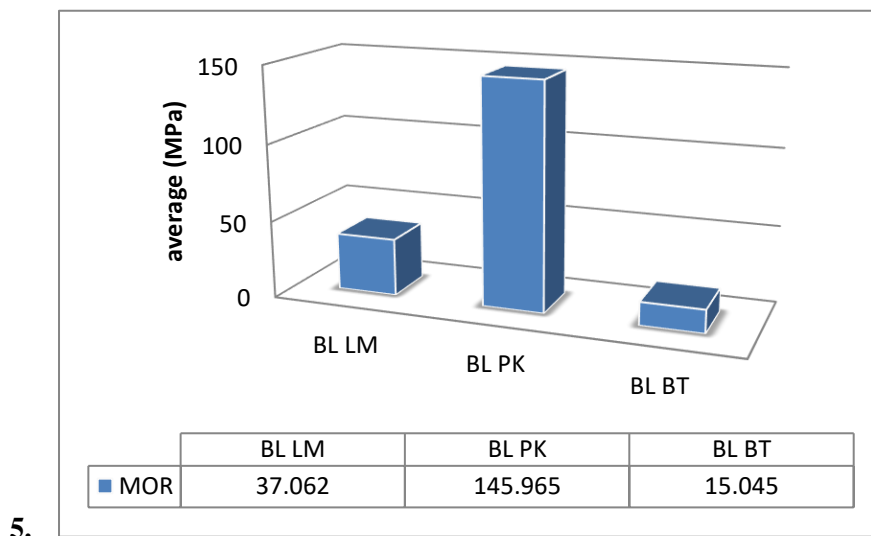
**Table 2.** Result of Meranti wood properties test

	Meranti wood		Reference strength (MPa)
	Average (MPa)	Standard deviation	
Moisture content		15.70	
Density		0.46	
Compressive strength parallel	30.14	1.56	16.72
Compressive strength perpendicular	6.38	1.71	2.16
Shear strength	2.68	0.11	1.51
Tensile strength	115.78	2.84	67.34
Bending Strength MOR	70.74	4.66	38.22
MOE		7726.60	

Tabel 2 shows that at a moisture content of 15.2%, the bending strength was 38.22 MPa, tensile strength of 67.34 MPa and MOE of 7726.60 MPa. These results indicate that this wood was on grade E7 based on SNI 7973 2013 classification. This proves that Meranti wood has a larger capacity compared to Mahang wood. So the placement of wood Mahang on the layer that closed to neutral axis of laminate beam was correct.

*4.3. Modulus of rapture (MOR) laminate beam*

MOR or bending strength determines the external load capacity capable of being retained by a beam (Yoresta, 2015). The average of MOR values for the three types of laminated beam variations can be seen in Figure 3.



**Figure 3** Test results Modulus of Rupture (MOR)

Based on Figure 3, Table 1 and Table 2, it can be seen that the MOR of the laminate beam has almost the same even higher than the solid beam (BS MA and BS ME on the Table 3). The MOR of BL PK higher than the others laminated beams of 145.96 MPa. These results indicate that the laminated beam was larger by 454.9% and 303.13% when compared to Mahang solid wood (BS MA) and Meranti solid wood (BS ME) respectively.

*5.1. Capacity of the beam*

The result of capacity analysis laminated beams for 3 types of adhesive variation and solid wood beam can be seen on Table 3.



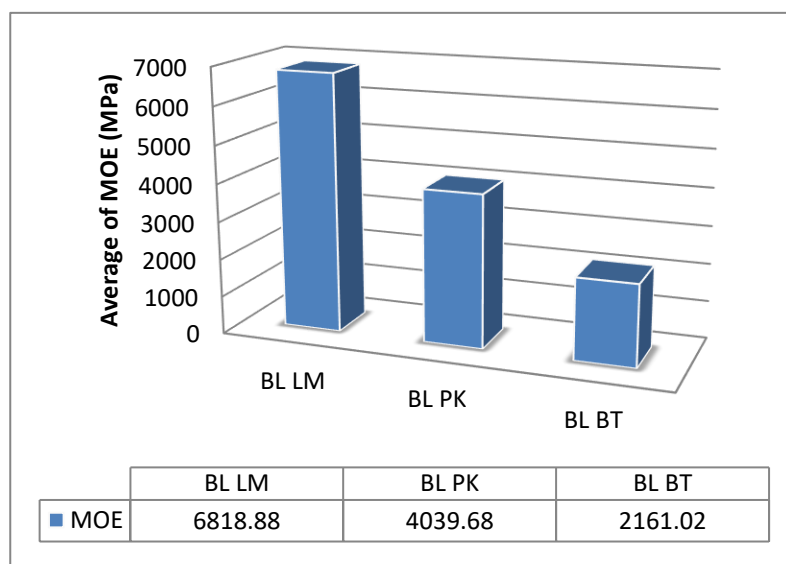
**Table 3** The capacity analysis of laminated beam and solid beam

No	Sample	$\Delta i$ (mm)	Pi (kN)	Mi (kN.m)	$\Delta u$ (mm)	Pu (kN)	Mu (kN.m)
1	BS MA	2.37	1.37	0.24	15.85	5.80	1.03
2	BS ME	2.37	1.99	0.35	15.51	8.27	1.47
3	BL LM	2.37	2.11	0.37	17.28	8.19	1.45
4	BL PK	2.37	0.63	0.11	106.19	30.75	5.46
5	BL BT	2.37	0.46	0.08	40.28	4.10	0.73

At the limit deflection of 2.37 mm, BL LM was able to resist the largest load compared to other beams, so the capacity (Mi) was also large 2 to 3 times compared to others laminate beams even higher than solid beams (BS MA) and (BS ME). This shows that the use of glue (Epoxy) can increase the capacity and given strengthened to the layers on the laminate beam so that the laminated beam was more monolithic than the adhesive bolts and nails. In the ultimit condition, the variation of BL LM and BL PK has almost the same capacity even greater than the solid beam. BL PK has the largest capacity of the three variations of laminate beam, which was 5.46 kN.m. This showed that the use of heavy wood (Meranti) at the outer layer combined with the nail as adhesive can increase the capacity of lightweight wooden beams (Mahang) when analyzed by bending capacity. This was similar to that stated by (Handayani 2016) that laminated technology with heavy wood loading gives increased utilization to light wood. Specimens of BL BT obtained smaller capacity of all variations of laminate beam that was to 0.73kN.m or decreased 42.79% when compared with BS MA and decreased 58.44% when compared to BS ME. This occurs because of the reduction of the cross-sectional area in the tensile area due to the placement of the connector such as bolts and nails.

*5.2. Modulus of elasticity*

The lamination beam MOR test was recorded with the maximum deflection of the laminate beam The results have been analyzed using the eqs (2) to determine the modulus of elasticity. The results can be seen in Figure 4.



**Figure 4** Test results of modulus of elasticity (MOE)

Figure 4 shows that BL LM has the largest MOE of 6818.8 MPa, followed by BL PK with MOE of 4039.6 MPa and BL BT with MOE of 2161,02 MPa. This indicates that BL LM has greater stiffness than other laminated beams, and BL PK or BL BT have lesser stiffness when compared to BS MA and BS ME. The use of nails and bolts as adhesives or connector can make the beginning of laminate beam failure. This was similar to that research by (Basuki et al 2015), which states that the use of nails on LVL beams provides the pressure that causes LVL body beam damage so that faster cracks occur in the body of the beam and affect the MOE of the beam

## 5. Conclusion

Based on the results of laboratory testing and analysis results of laminated wood beams of Meranti and Mahang wood, several conclusions can be drawn:

1. At the deflection limit, glue adhesive laminate beam (BL LM) has a larger capacity than the laminate adhesive bolt (BL BT) and the nail adhesive (BL PK), in contrast at the ultimate condition, the BL PK has greater capacity than others.
2. The use of glue and nail as adhesive on the laminate beam can increase the beam capacity and increase the MOR of laminate beam when compared with solid Mahang beams (BS MA).
3. The use of glue adhesive can increase the modulus of elastic (MOE) of laminated beams when compared with solid beam of Meranti (BS ME) and solid beam of Mahang (BS MA).

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## Test of Biodiesel Usage to Engine Performa on Dong Feng Diesel with Power 7 HP

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**Abstract.** This study aims to see the ability of Biodiesel fuel to Engine Performance on Dong Feng diesel engines with 7 kW Power. The biodiesel used was synthesized by Biodiesel using frying oil and methanol as well as limestone catalyst ( $\text{CaCO}_3$ ). There are 2 types of Biodiesel used, namely Biodiesel with synthetic catalysts (homogeneous) and Biodiesel with natural (heterogeneous) catalysts. The synthesis catalyst resulted in a 31.52% rendement, while the natural catalyst produced a 78.79% rendement. The produced biodiesel was tested on a Dong Feng diesel engine with 7 HP Power. To get a comparison of engine performance, Biodiesel fuel is used with synthetic catalysts (homogeneous), Biodiesel with natural (heterogeneous) catalysts, and Solar fuels. The results showed that the engine power produced from Biodiesel was lower than the engine power using Solar. Power from Biodiesel with synthetic catalysts (homogeneous) averages 33% lower than Power using Solar, while Biodiesel with natural catalysts (heterogeneous) is 41% lower than Solar-powered Power. Fuel Consumption, FC (g/ hour) on the engine using Solar is higher than FC engine using Biodiesel. FC from Biodiesel with synthetic (homogeneous) catalyst is an average of 7% lower than Solar, while Biodiesel with natural catalyst (heterogeneous) is 30% lower than Solar. This proves the use of Biodiesel fuel with heterogeneous catalysts is more economical than Solar fuels. Specific Fuel Consumption (SFC), also shows that SFC on a Solar fueled engine is almost equal to the SFC Biodiesel fueled engine. SFC from Biodiesel with synthesis catalyst (homogeneous) is 4% lower than Solar fuel, while Biodiesel with natural catalyst (heterogeneous) is 7% lower than Solar fuel.

Keywords: Biodiesel, Solar, catalyst, engine performance, Power, FC, SFC.

### 1. Introduction

Catalysts are needed to accelerate the formation of Biodiesel. Therefore, the catalyst plays a very important role in Biodiesel production [1]. Transesterification reactions with alkaline catalysts usually use alkali metals alkoxide, NaOH, KOH, and  $\text{NaHCO}_3$ . The use of this catalyst has a weakness, namely the separation of catalysts from their products is relatively difficult so that it will increase production costs [2]. The remaining base catalyst can also interfere with the further processing of the produced Biodiesel [3]. For this reason, it is necessary to make heterogeneous catalysts that are easier to separate and have high catalytic effectiveness. Heterogeneous catalyst research in Biodiesel synthesis is expected to find other advantages such as more environmentally friendly and can be directly used without the need for further modification [2].

Various types of catalysts such as BaO, MgO and  $\text{K}_2\text{CO}_3$  have been used for Biodiesel production and the results show that the maximum Biodiesel production obtained is 85%. Biodiesel production obtained was closely related to the base strength of the catalyst [4].

To find heterogeneous catalysts that have good efficiency, cheap and easy to obtain, it is necessary to make an inventory of the ability of heterogeneous catalysts in producing biodiesel. One heterogeneous catalyst that is very potential to increase the amount of production and reduce the production cost of Biodiesel is  $\text{CaCO}_3$ . The study of the use of natural  $\text{CaCO}_3$  will be compared with synthesis as a heterogeneous catalyst in Biodiesel production.

Biodiesel is a fuel from vegetable oil that has properties resembling petroleum diesel (Solar) and is an alternative to diesel fuel made from renewable sources. This fuel is environmentally friendly because it produces exhaust gas emissions which are far lower compared to diesel / solar, which is sulfur free. Biodiesel has a low smoke number, a higher cetane number so that it is clear burning, lubrication properties on the engine piston, and can decompose so that it does not produce toxins [5].

The chemical and physical properties of Biodiesel are almost the same as Solar so that Biodiesel can be used directly for diesel engines or mixed with Solar. Biodiesel contains oxygen, so the flash point is higher than Solar so that it is easy to burn. In addition, Biodiesel does not contain sulfur and carcinogenic benzene compounds. Therefore, Biodiesel is a cleaner and easier fuel to handle compared to Solar.

To see the ability of Biodiesel as a fuel motor fuel, the engine performance testing is performed, which can provide information about the engine's capabilities. The parameters displayed in engine performance are: 1). Torque, 2). Power, 3). Heat efficiency, 4). Specific fuel consumption.

## **2. Research Method**

### *2.1 Preparing Waste Cooking Oil*

Used cooking oil that is used in this study comes from used frying oil of fried chicken by street vendors in Sukajadi district, Pekanbaru. Used cooking oil that had been collected was filtered first with filter paper to remove sediment or other frying remnants [2].

### *2.2. Preparing Catalyst $\text{CaCO}_3$*

Natural limestone ( $\text{CaCO}_3$ ) which was still in the form of small lumps was crushed until smooth by using mortar and pestle. After smooth,  $\text{CaCO}_3$  was sieved using a 100 mesh sieve. Then  $\text{CaCO}_3$  was calcined in the furnace at  $950^\circ\text{C}$  for 3 hours to remove impurities and restructuring. After the calcination process was complete, the resulting  $\text{CaCO}_3$  catalyst was stored in a desiccator to keep the catalyst conditions dry, while the  $\text{CaCO}_3$  synthesis catalyst used manufacturing materials.  $\text{CaCO}_3$  was heated in an oven at  $105^\circ\text{C}$  to release water before use.

### *2.3. Biodiesel Synthesis*

Synthesis of Biodiesel was carried out using methanolysis process between used cooking oil and methanol. Used cooking oil is transesterified with methanol using  $\text{CaCO}_3$  catalyst. The transesterification process was carried out by homogenizing 8, 25 grams of  $\text{CaCO}_3$  catalyst and 165 ml of methanol for  $\pm 30$  minutes. After homogeneous, 825 ml of cooking oil was added to the mixture while stirring and heated at  $65^\circ\text{C}$  for 2 hours. The obtained biodiesel was then filtered to separate the Biodiesel mixture with  $\text{CaCO}_3$  catalyst (natural and synthesis). After being separated, the Biodiesel was put into a separating funnel and allowed to stand for 1 night to separate Biodiesel with glycerol. The biodiesel formed in the top layer was taken and then washed with warm water (temperature  $\pm 50^\circ\text{C}$ ). Then Biodiesel was purified by heating at a temperature of  $100^\circ\text{C}$ .

### *2.4. Engine Testing*

To find out whether the Biodiesel produced was suitable for use on the engine, Biodiesel run into the Dong Feng 7 HP diesel engine for determining the best formulation was carried out. Engine performance tests included torque, rotation, power, efficiency, specific fuel usage. In order to produce high performance, modifications can be made to the engine. As a comparison, the Solar, Biodiesel and synthetic catalysts (homogeneous) and Biodiesel with natural (heterogeneous) catalysts were used in this test.

To get the value of engine performance, measurements of rotation (RPM), load (kg), torque arm distance, fuel volume consumed (cc), and operating time (seconds) were measured. From the measurement results, Torque, Power and specific fuel usage can be calculated. The amount of power can be calculated by the formula:

$$P \text{ (kW)} = 2 \cdot \pi \cdot n \cdot T \quad (1)$$

Where : T = torque (Nm)

Specific fuel usage (SFC) is the use of fuel per time divided by the power produced.

$$SFC = \frac{FC}{P} \quad (2)$$

Engine testing can also be done using Solar fuel to see the comparison of engine performance between Biodiesel fuel and Solar fuel.

### 3. Result and Discussion

The results of the research are shown in table 1 and 2 as follows:

**Table 1.** Result of Biodiesel Synthesis

NO	Oil Comparison : Methanol : Catalyst	Color	Rendement (% v oil)
1	5 : 1 : 1% CaCO <sub>3</sub> synthesis (homogeneous)	Clear Yellow	31,52
2	5 : 1 : 1% CaCO <sub>3</sub> natural (heterogeneous)	Reddish Yellow	78,79

**Table 2.** Characterization of Biodiesel

NO	Parameter	Unit	CaCO <sub>3</sub> synthesis	CaCO <sub>3</sub> natural	SNI-04-7182-2012
1	Biodiesel Density	(kg/m <sup>3</sup> )	881	899	850-890
2	Amount of Water	%	< 0.05	< 0.05	Max. 0,05
3	Sediment	%	< LOD	< LOD	Max. 0,05
4	Iodine Number	mass (g-12/100 g)	59,14	63,15	Max. 115
5	Acid Number	mg-KOH/g	1,38	1,08	Max 0,8

The synthesis process of Biodiesel with used cooking oil and methanol was carried out using a comparison between oil: methanol: catalyst of 5: 1: 1% catalyst (of oil weight) and heating at 65°C for 120 minutes. The optimum time for the Biodiesel transesterification process is 120 minutes [8]. When the catalyst is used which is <1% (weight of oil) the product produced is not maximal, whereas if the catalyst is > 10%, the mixture of catalysts and reactants will become too thick, so that the results formed are also not optimal.

In table 1, it can be seen that the use of synthetic (homogeneous) CaCO<sub>3</sub> catalyst produces Biodiesel with a 31.52% rendement and clear yellow color, while the use of natural (heterogeneous) CaCO<sub>3</sub> catalyst produces Biodiesel with a 78.79% yield and reddish yellow color.

#### 3.1. Density

Both of the biodiesel produced meet the SNI Biodiesel for density parameters, which are 850-890 kg/m<sup>3</sup>. The mass of Biodiesel produced is 881 (CaCO<sub>3</sub> synthesis) and 899 kg / m<sup>3</sup> (natural CaCO<sub>3</sub>). Biodiesel that has a density greater than the provisions, an imperfect reaction will occur in the conversion of used cooking oil. Biodiesel with a quality like this cannot be used for diesel engines because it will increase engine wear, emissions, and cause damage to the engine [11].

#### 3.2. Acid Number

Both of the biodiesel synthesized from the heterogeneous catalyst CaCO<sub>3</sub> meet SNI 04-7182-2012 for acid number parameters (max 0.8 mg-KOH / g). Biodiesel acid value using synthesis CaCO<sub>3</sub> is 1.38 mg-KOH / g,

while Biodiesel with natural CaCO<sub>3</sub> catalyst is lower at 1.08 mg-KOH / g. High acidity is an indicator of Biodiesel which still contains free fatty acids [11].

### 3.3. Water and sediment content

Based on the results of testing the water and sediment content, the Biodiesel sample from CaCO<sub>3</sub> catalyst did not show any water or sediment content. This shows that when the heterogeneous catalyst separation process is used completely separately, and when the process of purifying the water remaining from the previous washing process has also completely evaporated, sediments contained in Biodiesel can clog and damage the engine [6].

Because the absence of sediment content in the Biodiesel sample shows that a perfect separation process does not leave the CaCO<sub>3</sub> catalyst. Thus the Biodiesel produced can be applied to diesel engines.

### 3.4. Iodine number

The iodine number is a parameter used to show the number of double bonds in the fatty acid composing Biodiesel. Biodiesel with high iodine content (> 115) will result in a tendency to be polymerized and form deposits in the engine during the combustion process [12].

In the iodine number test, the biodiesel synthesized using CaCO<sub>3</sub> synthesis and natural CaCO<sub>3</sub> catalysts were 59.14 and 63.15 g-12/100 g, respectively. The iodine number meets the quality requirements of SNI 04-7182-2012. Thus, the Biodiesel is expected to be used as a substitute fuel for Solar.

### 3.5. Engine Performance

Dong Feng diesel engine specifications used are a maximum power of 7 HP and a maximum rotation of 2600 rpm. In the first test, solar fuel was used, and then Biodiesel fuel with synthesis catalyst, as well as Biodiesel with natural catalyst.

The results of data collection from this test are as in table 3, table 4 and table 5

**Table 3** Engine Testing Data with Solar Fuels

No.	Rotation (RPM)	Load (kg)	Arm distance (m)	Fuel Volume (cc)	time (second)
1	1520	3.6	0.35	14	30
2	1660	4.1	0.35	17	36
3	1870	4.6	0.35	20	45
4	1960	4.8	0.35	15	36
5	2030	5.1	0.35	19	45
6	2250	5.3	0.35	20	38
7	2310	5.4	0.35	20	32
8	2370	5.5	0.35	17	26
9	2460	5.8	0.35	14	19
10	2510	5.9	0.35	20	25
11	2550	5.7	0.35	21	22

**Table 4** Machine Testing Data with Synthesis Catalyst Biodiesel Fuel

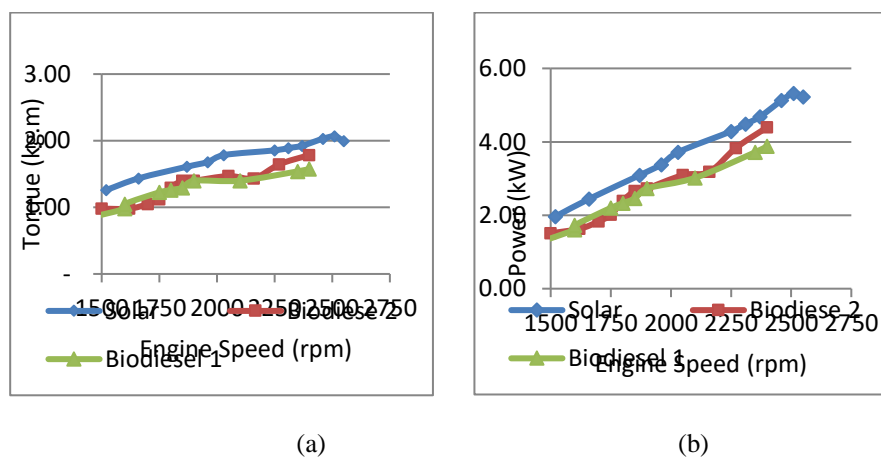
No.	Rotation (RPM)	Load (kg)	Arm distance (m)	Fuel Volume (cc)	time (second)
1	1500	2.8	0.35	9	20
2	1620	2.8	0.35	8	19.5
3	1700	3	0.35	8	22.3
4	1750	3.2	0.35	7	20.6
5	1800	3.7	0.35	6	17.4
6	1850	4	0.35	6	16.2

7	1900	4	0.35	6	18
8	2050	4.2	0.35	5	13.4
9	2160	4.1	0.35	6	16.06
10	2270	4.7	0.35	8	17.2
11	2400	5.1	0.35	10	18.4

**Table 5** Data Testing Machines with Natural Catalyst Biodiesel Fuels

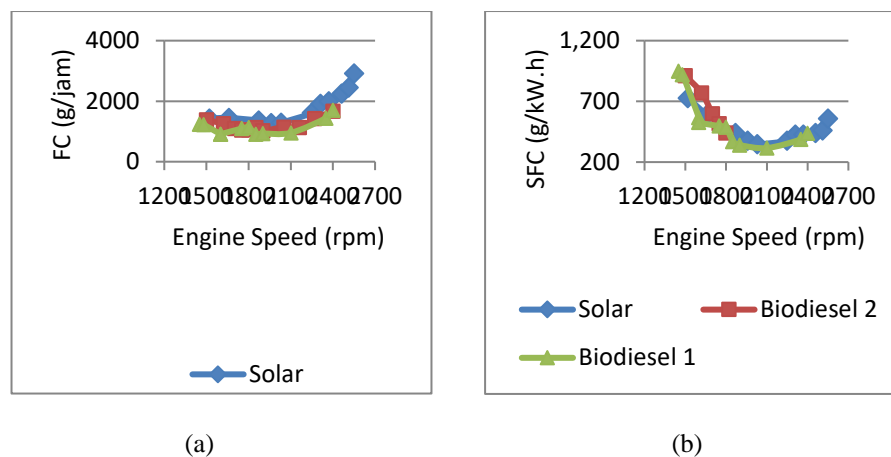
No.	Rotation (RPM)	Load (kg)	Arm distance (m)	Fuel Volume (cc)	time (second)
1	1450	2.5	0.35	10	24.76
2	1480	2.5	0.35	6	15.03
3	1600	2.8	0.35	8	26.91
4	1600	3	0.35	6	20.2
5	1750	3.5	0.35	5	14
6	1800	3.6	0.35	5	13.5
7	1850	3.7	0.35	6	20.2
8	1900	4	0.35	4	13.16
9	2100	4	0.35	5	16.06
10	2350	4.4	0.35	8	17
11	2400	4.5	0.35	10	18

Test data from Tables 3, 4 and 5 are processed using equations (1) and (2) to obtain torque, power, fuel consumption per hour, and specific fuel usage. The results can be seen in the graph in Figures 1, 2, 3 and 4.



**Figure 1.** (a) Graph of Engine Speed Relationship with Torque, (b) Graph of Engine Speed Relationship with Power

Based on the graph in Figure 1 (a) it is seen that the torque on a Biodiesel fueled engine is lower than the torque of a diesel fueled engine. Whereas in Figure 1 (b) it can be seen that the power of a Biodiesel fueled engine is lower than the power of a diesel fueled engine. The average difference in Power between Biodiesel 1 and Biodiesel 2 with Solar is 41% and 33%.



**Figure 2.** (a) Graph of Engine Speed Relationship with Hourly Fuel Consumption (FC), (b) Graph of Engine Speed Relationship with Specific Fuel Consumption (SFC)

In Figure 2 (a) it can be seen that the fuel consumption (FC, g/hour) on a diesel fueled engine is higher than the fuel consumption of a Biodiesel fueled engine. This means that the use of Biodiesel fuel is more efficient than Solar fuel. The average difference in fuel consumption between Biodiesel 1 and Biodiesel 2 with Solar is 7% and 30%. Specific fuel use (SFC) is the ratio of fuel usage per hour to the power produced. In Figure 2 (b) it can be seen that the specific fuel consumption (SFC) on a diesel fueled engine is almost equal to the fuel consumption of a Biodiesel fueled engine. The average difference in specific fuel consumption between Biodiesel 1 and Biodiesel 2 with Solar is 4% and 7%. This means that the use of Biodiesel fuel is more efficient than diesel fuel, but the power produced by diesel fuel is higher than Biodiesel fuel

#### 4. Conclusion

Randemen Biodiesel which uses natural  $\text{CaCO}_3$  catalyst is higher which is 78.79% compared to  $\text{CaCO}_3$  synthesis which is 31.52%. However, qualitatively, the biodiesel produced from both catalysts meets the requirements of SNI 04-7182-2012. Heterogeneous catalysts ( $\text{CaCO}_3$ ) have the potential to produce economical and environmentally friendly biodiesel. Biodiesel can be used as a fuel for Diesel Engines. Torque and power generated from Biodiesel fuel is lower than Solar fuel, but the consumption of Biodiesel fuel is smaller than Solar fuel. This means that Biodiesel fuel is more efficient than Solar fuel

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# **Risk Management Analysis Of Academic Information System Using Allegro Octave Method (Case Study: Academic Information Systems University of Muhammadiyah Riau)**

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**Abstract.** The application of Information Technology (IT) in the form of Academic Information Systems at the University of Muhammadiyah Riau (UMRI) has been carried out since 2010. Currently, academic activities at UMRI are very dependent on the existence of the information system. Activities carried out through academic information systems include student lecture registration, student study results, lecturer and student master data, scheduling lectures, lecture absences, and others. The application of this academic information system can pose a risk if the UMRI fails to assess the source of risk threats. This can result in the impact of information services being disrupted and the cessation of the decision making process. Risk is an uncertainty that can have a negative impact on an organization. Since its implementation to date, UMRI has never carried out systematic risk management. Even though the use of academic information systems at UMRI is currently crucial. Risk management is an effort from planning, organizing, leadership, controlling resources and activities to minimize the impact of losses and uncertainty on costs and consequences. Thus, risk management of information systems should be carried out by organizations that utilize Information Technology to support their activities. One method that can be used to build risk management of information systems is the Octave Allegro method. This method is a methodology for identifying risks to information systems related to information system security. Octave defines important components in a comprehensive, systematic, context-based information system security risk evaluation. The Octave Allegro method consists of 8 (eight) stages. The final result of this study is in the form of a risk assessment table and mitigation of risks to information assets. There are 8 (eight) crucial assets with a level of risk assessment of as low as 1 (one), moderate as much as 5 (five) and high as much as 2 (two).

**Keywords :** Academic Information Systems, Risks, Management Risk, Octave Allegro, Low, Moderate, High.

## **1. Introduction**

The following are the things that underlie the research related to asset identification at Universitas Muhammadiyah Riau.

### *1.1 Background*

Information technology is one of the supporting factors in increasing the productivity of business processes of an organization in the era of globalization that is growing rapidly. The application of information technology must be balanced with adequate management. The same is true with education service providers that need information as a foundation for successful performance. One application of information technology in the academic field is an academic information system. According to Rilyani (2015), the academic information system is one of the integrated systems that become a media link

between academic communities. Thus, the information system can simplify the work and accelerate the work process related to academic activities in educational institutions.

Universitas Muhammadiyah Riau (UMRI) is one of the private educational institutions in Riau Province. Academic activities at UMRI have been supported by information technology in the form of Academic Information System of Universitas Muhammadiyah Riau. Academic Information System at UMRI has been used since 2010. It is supported by various features that enable Academics in UMRI to interact through an integrated system. Activities that are usually carried out through an Academic Information System include academic registration, scheduling of lectures, academic results, master data of lecturers and students, and others. The increasing use of Information Technology in the academic field, especially the use of information systems at UMRI, is also in line with the increasing risk of Information Technology that must be faced by UMRI. This happens because in addition to the positive effects that arise due to the development of information systems, security problems and management of IT resources also occur. The security problem referred to in this statement relates to the risk of Information Technology.

In this study, the risk identification stage is carried out. At the initial stage, identification of information assets is carried out in the implementation of academic information systems at Universitas Muhammadiyah Riau.

## **2. Method**

In identifying information assets, it is carried out in three stages using a worksheet developed by octave allegro. The following are the stages of asset identification.

### *2.1 Developing an Information Asset Profile*

The risk assessment conducted focuses on assessing the information assets of the Academic Information System. This step begins by defining the information assets of the Academic Information System, in the form of names, user descriptions, and core processes in carrying out these assets. This helps the Information Technology and Database Unit of UMRI (TIPD) to identify all information assets vulnerable to disclosure, modification, loss/damage, and interruption. Profiles are created for each information asset.

### *2.2 Identifying crucial asset*

To determine critical information assets in the Academic Information System, it can be seen from the system process, what activities are related to the system. Academic Information System is used by UMRI for data processing activities of students and employees/lecturers, namely processing the complete profile of students and lecturers, and student financial data. The Information System has several uses by dividing into several modules, namely employee modules, lecturers and student modules. The form of a table is to determine the critical information assets that contain modules, users and core processes. The module means the system information section used and in the module there are menus for system activity. The intended user is the owner or the party operating the module. The core process is the activity carried out on the information system used. Before determining the most critical information assets, the worksheet critical asset is used as follows:

**Table 1** *Critical asset (Menu name)*

<i>Critical Asset</i>	(Menu name)
<i>Rational for Selection</i>	
<i>Description</i>	
<i>Owner</i>	
<i>Security Requirements</i>	
	<i>Confidentiality</i>
	<i>Integrity</i>
	<i>Availability</i>
<i>Important Security Requirement</i>	

In table 1, critical asset is to determine the menu to be documented in column (1). The next step is to use Rationale for selection to document the reasons for selecting critical information assets in column (2) in the Critical Information Asset Profile. Then fill in a description of the critical information assets in column (3) of the Critical Information Asset Profile. Define the scope of Information Asset and that agreed and general definitions will be used. Then identify and document the owner of critical information assets (referring to the definition provided to determine which one is the owner). This information is filled in column (4) Critical Information Asset Profile. Furthermore, filling security needs for Confidentiality means that the confidentiality of information from these assets, Integrity means the truth and accuracy of the information on the related assets and Availability means the availability of information on the asset related information in column (5) on the Critical Information Asset Worksheet. It starts by marking needs that can be applied to information assets and forwarded by filling out information that complements the statement of security needs. On the right of this statement, it can be added with needs or more specific needs. Then the next step is to identify the most important security needs for information assets by selecting one of the security needs in column (6) of the Critical Information Asset Worksheet. This information is used when determining the potential impact of risk.

### 2.3 Identifying the Information Asset Container

There are 3 very important points about security and the concept of information asset containers, namely technical, people and physical. Container is a place where information assets are stored, sent, or processed so that they can be points of vulnerability and threats that position information assets at risk, and conversely containers, can be places where control can be implemented.

The container is specifically identified from several types of information technology assets such as hardware, software or systems. The first is done by determining information assets in a technical asset container that includes technological assets (software, application systems, servers, networks or hardware), physical containers can also be physical objects such as paper and container people in the form of ownership such as who is the user of the information assets. The following are forms of technical, people and physical container asset tables. To identify container assets, the following sheet is used:

**Table 2** Container asset menu of employee data

Menu of Employee and Lecturer Data	
<i>Information Asset Risk Environment Map (Technical)</i>	
Internal	
<i>Container Description</i>	Owner(s)
<i>External Container Description</i>	Owner(s)
-	-

In table 2, the asset technical container in column (1) is used to fill in the menu name, information asset risk environment map (technical) in column (2) is to state the mapping of information asset risk environment including software, hardware, server, application system, internal in column (3) is to state the organization that uses it. Container description for descriptions of asset information stored, sent and processed are in column (4). Owners to state the system owner or user are in column (5). And column (6) is to state that there is no outside party involved in the activity on the related information system.

Container asset people are to state the owner or user of the information system, and who carry and store the information assets. The container description contains the user related to the information system used, while the owners are the names of the information assets used.

Physical asset containers are used to declare file folders where they are stored in physical form, for example paper. As in the table 1.4, container physical assets the employee data menu is for the container description containing a paycheck/slip, while the owner is the employee and lecturer concerned.

### 2.4 Data Collection Stages

Data collection methods are carried out to obtain information, main data and other supporting data needed in order to achieve the research objectives. Data collection is obtained from research objects in the following ways:

#### 1. Literature Study

Literature study activities are carried out by studying and researching various literature. The literature is obtained from libraries such as from books, scientific journals, internet sites, and other literature related to this research.

#### 2. Field Study

Field study activities are carried out by conducting a direct or indirect review study. The review was conducted at the Head of the UPT Information Technology and Database of UMRI, lecturers, students and employees as well as document review.

## 3. Results and Discussion

The following are the results of asset identification carried out.

### 3.1 Developing Information Asset Profile

The risk assessment conducted focuses on assessing the information assets of the Academic Information System. This step begins by defining the information assets of the Academic Information System, then identifying the container assets, where the assets are stored and who owns the assets. This helps the TIPD UMRI to identify all information assets vulnerable to disclosure, modification, loss/damage, and

interruption. Profiles are created for each information asset. At this stage, 11 assets are produced from the academic information system.

### *3.2 Identifying crucial asset*

Determination of critical information assets refers to the process of Academic Information Systems. Critical information assets are information assets used in the processing of Academic Information Systems. The information assets that have been determined as critical information assets are recorded in the critical asset information worksheet. The information assets selected after considering several questions are:

1. An important information asset for UMRI
2. Asset information used in daily operational activities
3. Information assets which, if lost, can interfere with the ability of UMRI in achieving UMRI's goals and mission.

From the results of the above considerations, there are several information assets categorized as important information assets: Employee and lecturer modules consisting of employee data menu, attendance menu, attendance correction menu, academic menu, and research and publication menu. Student modules consist of academic record transcripts, study plan, study results, exam card, schedule, and payment data menu.

From the information assets that have been determined, the most critical information assets for UMRI are determined. A bad impact will be faced by UMRI if the following things happen regarding the critical information asset:

1. The information assets are modified without authorization
2. The information assets are lost or damaged
3. The information assets are accessed by people who do not have permission
4. The information assets are critical for academic information systems and UMRI

From the above questions and the considerations of the TIPD UMRI, the critical assets are the information assets contained in student modules and employee & lecturer modules, because this is where the core process is carried out. The critical information assets are: The employee and lecturer modules consisting of employee data menu, attendance menu, research and publication menu and academic menu. Student modules have a menu of academic record transcripts, study plan menu, study results menu and payment data menu. Then the critical assets above are documented on the critical asset worksheet. After filling in the critical asset worksheet, 8 critical information asset tables are obtained, namely employee data menu, attendance menu, research and publication menu, academic menu, academic transcript menu, study plan menu, study result menu and payment data menu.

### *3.3 Identifying Container from Information Asset*

There are 3 very important points about security and the concept of information asset containers, namely technical, people and physical. Container is a place where information assets are stored, sent, or processed so that they can be points of vulnerability and threats that position information assets at risk, and conversely containers, can be places where control can be implemented.

Specifically it is identified from several types of information technology assets such as hardware, software or systems. The first is done by determining information assets in a technical asset container that includes technological assets (software, application systems, servers, networks or hardware), physical containers can also be physical objects such as paper and container people are in the form of ownership such as who the user of the information assets is.

Based on the results obtained after carrying out container assets in 3 aspects, namely technical, people and physical, technical containers are employee data menu, attendance menu, research and publication menu, academic menu, academic transcript menu, study plan menu, study results menu, and payment data menu. People container includes employee data menu, attendance menu, research and publication menu, academic menu, academic transcript menu, study plan menu, study result menu and payment data menu. While physical containers include employee data menu, research and publication menu, academic menu, academic transcripts menu, study results menu and payment data menu.

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**SOCIAL &  
HUMANITIES**

# The Functions of Lubuk Larangan for the Community of Tanjung Belit Village

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**Abstract.** One of the famous maritime potential in Tanjung Belit Village is Lubuk Larangan. Emerging since 1978, this tradition is deliberately developed by Indigenous Peoples because it is very beneficial for the Community along the Subayang River not only to save the fish population, but also to avoid the surrounding community from ignorance of the environment and each other.

The objectives of the research are: to describe the function of the existence of the lubuk larangan for the life of the people of Tanjung Belit Village. The research method used is qualitative approach (qualitative research). The location of this research is in the Village of Tanjung Belit Kampar Kiri Hulu District Kampar Regency. Selection of informants is done based on a specific purpose, namely using purposive sampling. The informants or subjects in this study are ninik mamak / customary leaders, village chiefs, community leaders and some people of the community. The management of lubuk larangan is done jointly by the community and ninik mamak. The functions of Lubuk Larangan for the Community of Tanjung Belit Village are: Economic function, social function and integration and environmental conservation function.

## 1. Preface

The regency of Kampar is the region that donates into the living space potential such as the tourism of nature and river. One and it is defeated important is the tradition of Lubuk Lrangan in Subayang River. This tradition includes the shapes of local giniues of the villagers of Tanjung Belit in managing and taking care of the fish along the current of Subayang River. The management that is still traditional, natural and hasn't still been developed yet in maximum has distinctive feature from the icon of lubuk larangan in the village of Tanjung Belit.

Lubuk Larangan is a part of Subayang River with the length about 100 meters. Called Lubuk, because in one part of the river has the depth more than another side of other rivers. The fish that live there will be kept, because the local society will just do the harvest once a year, based on the agreement and the society discussion with the custom figure there.

In the cultural local wisdom of society of Tanjung Belit still defends the hereditary tradition that is used to be done by the elders or their earlier headmen so that their togetherness with the people in keeping the nature environment perpetuation, especially lubuk larnagan is still maintained until now. The existence of lubuk larangan gives the own bless for the society especially the crammed full fish harvest and many kinds of fish live inside that can be sold for the fish harvest of people in the big events of religious later.

Hence, in keeping the nature perpetuation from this lubuk larangan, it's certainly that there is not guarded well and especially in exploring the village's potential result that has selling price and superiority from the side of nature tourism and economy. Here, the role of government and various sides/stakeholders is claimed in supporting and building the potential of lubuk larnagna in the village of Tanjung Belit in order to fulfill the necessary of the local society.

## 2. The Goal Of Research

Based on the background, there is a goal in this research namely: "Describing the role and function of Lubuk Larangan for the society in the Village of Tanjung Belit, Subdistrict of Kampar Kiri Hulu".

## 3. Theory Review

A culture is obtained through the learning process of the individuals as interaction result of group members one another, so the culture has also characteristic to be owned together. The culture as social inheritance in this thing is differed (contras) as organic inheritance. It is one of important factor that causes us to be able to live together in an organized society. (Supardi Suparlan, 1996: 83)

We realize that norms/laws of custom has role in supporting the living space establishment. This thing reminds the tight relation among the society, especially in the rural with the nature, in this thing so the the habit custom of the villagers that supports the perpetuation of natural resource and living space needs to be maintained, even developed (Jacobus Ranjabar, 2013 :122-123).

The culture has very big function for the human and the society. Various strengths that must be faced by the society and its member, such as the nature strength and other strengths in the own society that are not always good for it. Except that, the human and the society need the satisfaction, both in the sector of spiritual and material. Most part of the needs of the society is fulfilled by the culture that has a source of the own society. Called a big part of the culture ability that is the creation result is also limited in fulfilling all needs. The work of the society makes the technology or the culture that has main use in protecting the society toward the environment inside. The culture that is in the same manner as explained above is owned by every society. The difference is in the society culture that is more perfect than another society culture, in its development to fulfill all needs of the society. In the relation, it's usually given the name of civilization to the culture that has reached the development level of higher technology (Soerjono Soekanto, 2013 : 152).

The function of cultural system is ordering and placing the actions and behaviour of human. The learning process from this cultural system is implemented through the cultivation or the institutionalization. In this institutionalization process, an individual learns and adapts the thinking nature its attitude with the customs and traditions, the system of norm and rule that live in the culture. After the feeling and value of culture that give the motivation on the imitating action are internalized in the personality, so the action will be a steady pattern, and the norm that arranges the action is cultivated (Jacobus Ranjabar, 2013 : 9).

Although as a society has the culture that is different one another, but every culture has authentic characteristic that is valid in general for all cultures everywhere. The authentic characteristic of the culture is as followings:

- a. The culture is created and channeled through the human's behaviour
- b. The culture has been more previous, preceding the born of a certain generation and will not be died with the end of involved generation age.
- c. The culture is needed by the human and created in the behaviour.
- d. The culture includes the rules that contain the obligations, accepted or refused actions, forbidden actions and allowed actions (Jacobus Ranjabar, 2013 : 31-33).

A system of cultural provides the tradition namely a set of model to behave that has source from the system of value and main idea, the tradition is also a whole system, that consists of the way of giving aspect of statement behavior meaning, ritual behavior, and some kinds of other behaviors from the human or a sum of human that does the action one another, and small element such as symbol that includes consirutive symbol (the shape of belief), norm evaluation symbol, and expression system (symbol that relates feeling reveal). So, in understanding the the tradition is the behavior or thinking orientation or material thing or idea that come from the past that is taken by the people in this time. The attitude and this orientation place special part from the whole historical inheritance and take it to be the

tradition (Mursal Esten, 1999:22)

Moh Nur Hakim (2003: 29) reveals that the tradition is all past inheritances in our time and enters into the culture. In terminology, the word of the tradition contains a hidden meaning about the relation between the past and the nowadays. It shows into something inherited in the past that was in the form and has function in the nowadays, the tradition shows how the member of the society that behaves, both in the life that has characteristic of worldly and toward the mysterious or religious thing.

In a tradition arranged how the human relates with other human or a group with the group or another group, how the human acts with the environment and how the human behaves toward another nature. It develops in a system that has the value and the norm and all at once arranges the use of sanction and threat toward the deviation and the infraction.

Ayatrohaedi (1986:40-41) reveals that the element of the tradition and the culture of this region has potential as local genius because its ability has been examined to struggle until now. The features of local genius are as followings:

1. being able to struggle toward another culture.
2. having ability to accomodate the elements of another culture.
3. having ability to integrate the element of another culture into original culture.
4. having ability to control
5. being able to give the direction to the development of the culture.

### **3. The Research Method**

This research uses descriptive analyze with the qualitative approach. The location of the research is in the village of Tanjung Belit. For determining the subject in this research, used the purposive sampling method where the sampling by choosing the people based on the criteria that has been determined first of all by the researcher based on the research goal. The subject in this research is the informant that knows about lubuk larangan that lives in the Village of Tanjung Belit, Subdistrict of Kampar Kiri Hulu, and Regency of Kampar. Among others that becomes the subject of this research namely the village elders, such as Datuk Godang as the custom holder, The Village Headman such as informant key, and the society figure and the origin villager that know the information about Lubuk Larangan.

### **4. The Result of Research and Discussion**

The society of Subayang River edge implements the custom tradition through The Fish Harvest in a place that is called with Lubuk Larangan, where that area has been agreed forbidden based on the rule of custom and the law of custom that are valid in the society of custom, the point is they may not catch the fish inside (the potential of river) in the kind of system, Lubuk Larangan is meant is a forbidden river area, and Lubuk means a part from the certain location, the river that has the depth maximum for example it has the depth + 3 – 4 meter, this place that is intentional chosen certainly will be liked by the big fish. This area just can be cultivated based on the decision of custom society. This Lubuk Larangan came or stood since 1978, this tradition is intentional developed in the level of custom society because basicly it's very useful for the custom society that lives along the Subayang River that located in the Subdistrict of Kampar Kiri Hulu, Regency of Kampar, Riau Province.

#### *4.1. The Function of Lubuk Larangan For the Villager of Tanjung Belit*

##### *The Function of Economy*

Lubuk Larangan has economical value for the villager of Tanjung Belit, because of this lubuk larangan, the society can't catch the fish whenever. The result will be held in the event of catch or the harvest so that the catch result that is obtained by the society is much enough. This thing is because there is prohibition that has been determined first at all involved with the time and the way of cultivating the fish in lubuk larangan. Every fish harvest, the society can obtain the income from the catch result, by selling the catch result to the society that comes from other villages that comes to visit when the fish harvest is done, besides that the catch result will also be divided for every person or inhabitant that

domociles in the village of Tanjung Belit and can be become for fulfilling the daily food needs.

Nevertheless, this function of economy is not so maximum to be felt by the society but it's very potential to be developed. Some obstacles that are faced by the society among other because the management involved marketing of harvest result fish is still limited and simple, there is no promotion or effort to look for and invite the buyer meanwhile the sum of visitor that comes and is interested to buy the fish in the harvest time is also very limited. Besides that, the harvest result only can be sold in the form of fresh fish so the market segment is also limited. The local society especially the manager of lubuk larangan has not yet got the help or the training involved the management of fish harvest result to be foodstuff or other fickle that can increase selling price.

#### *The Function of Social and Integration*

The tradition of fish harvest of lubuk larangan is the hereditary tradition from the villager of Tanjung Belit village that is still maintained the perpetuation until this time. Among the use from this lubuk larangan is tighten the friendship and the integration back among the villagers and hold on the tradition values of nation such as customs and traditions, agreement discussion, cooperation and social solidarity.

Before the harvest activity of fish or tradition of batobo manokau ikan of lubuk larangan is held, first at all the discussion is held or known with kerapatan adat, among the tribes that are in the village of Tanjung Belit. In the custom density of Batobo manokau ikan of lubuk larangan will be determined the day, the cultivation schedule, the implementation committee, all those things are decided by the custom authority holder namely Datuk Godang. The following is the information from Mr Siamri as the custom leader (Datuk Godang):

*"The fish harvest is done once a year around the beginning of June-August depending on the water condition of river and weather. The harvest activity usually or we call usual with this Batobo manokau ikan is held on Friday with the reason of good day"*(Interview, April 2018 at 14.00).

In the custom density so the implementation committee is determined. There are no special criteria in choosing the committee for the disclosure or the harvest of lubuk larangan in this area. It's only sincere and ready to give the power; they have been able to be the committee. The harvest committee includes the villager elders, the village apparatus, the youth and the society.

When the fish harvest is implemented in lubuk larangan, the donation is also held by the society, allocated for helping the mosque construction, helping the orphans and old widows. Such as the information of Mr. Siamri as followings:

*"The result from this lubuk larangan is for helping the orphans, the widow, and the mosque construction."*(Interview, April 2018 at 14. 30 wib)

Even so, according to the Village headman IV of Tanjung Belit Village, the information of Mr Afrizal as followings:

*"...Taking care of the fish and the result in the form of money, the part will be given to the youth bound, for the mosque construction and the help of orphans. Depending on the needs, for example it's because the mosque is being built so the mosque is given much percents."*(Interview, April 2018 at 14.55 wib).

The information is also sama according to Mrs. Sabar (the villager), as following:

*"...The harvest is big event, crowded to catch the fish, cooking together and eating together, the big fish of pouch is sold, the result is sold at auction for the mosque, the part is donated for the orphans."* (Interview, April 2018 at 15.15 wib)

Together with the information of Mrs. Alfi as followings:

*“the people can gather for the discussion, even the villagers that come from the other cities also go to the hometown to accompany at the time of lubuk larangan’s harvest (Interview, April 2018 at 15.40 wib)*

The information of Herman as the delegation of the local youth, as followings:

*“the auction result is for helping the organization activity of local youth, the village development and the mosque construction.” (Interview, April 2018 at 16.05 wib)*

### *The Environment Perpetuation*

When the fish harvest in lubuk larangan, it’s not verified to catch all measures of fish and the fish that may not be caught for the consumption and the auction namely the fish that has big measure namely with the measure around the minimum four fingers or 250 gram/fish.

This prohibiting has goal so that the small fish are given the chance to be big and can lay the egg besides that the bigger fish catch has delicious and crispier meat and it can be also so that the fish in the watery is not used of or the generation is broken off. Besides that, the fish catch may not use the chemical material.



Picture 1.1

The Activity of fish harvest in Lubuk Lrangan of Tanjung Belit Village  
(the process of choosing and selling at auction the fish)

Moreover, taking care of the vegetation in the edge of the river also has been practiced by the villagers of Tanjung Belit village not by cutting the forest at random. Furthermore, lubuk larangan is in the area of wildlife reserve of Bukit Rimbang Baling that is the rich area with the natural ecosystem. The society in Tanjung Belit village really maintains the ecosystem perpetuation of river watery. The society realizes how much important to keep the river and the forest. Because the surroundings until now depend on the river, both for the household needs and the transportation.

The institution of nature conservation of *World Wildlife Fund (WWF)* Riau evaluates the tradition of lubuk larangan is a local genius of villagers of Tanjung Belit that deserves to be maintained to keep the perpetuation of the river and the forest. Through the tradition of lubuk larangan, the villagers of Tanjung Belit have the rescuing vision of environment moreover the village is in the buffer zone of wildlife reserve of Bukit Rimbang Baling. For keeping the river in order to be kept and unpolluted, the people start to maintain the forest.

The people realize that the impact of the forest cutting causes the stream flow getting swifter that causes the flood. The impact, the fish also can't hold on in one place. Thus, according to the respondent that is one of the delegations from WWF tells that the guarded natural forest will defend the population of natural diversity that occupies Bukit Rimbang Baling, especially Sumatera Lion.



Picture 1.2

The beautiful vegetation condition of river edge of Subayang of Tanjung Belit village  
(The river is the buffer zone of wildlife reserve of Bukit Rimbang Baling)

This management of *lubuk larangan* is implemented together by the society, the villager's elders and the equipment of village. In the management, there is no the division of labor such as the leader, treasury and secretary. But at the time of the harvest, they divide the task such as the secretariat such as the villager's elders, the village apparatus, the youth and the society that are arranged and decided together. The arranging of the secretariat is only the meber that arranges and controls when the harvest is done in *lubuk larangan*. But the subject of the harvest is implemented by all villagers that want to help and the candidats that will buy the harvest result of *lubuk larangan*, both the self of villagers and from other villages.

The conciousness of the society in the subdistrict of Kampar Kiri Hulu on the natural resource that they process well is the shape of the caring proof toward the environment and their furute. The good management by the society will also produce the good result for the society. The management basicly has the goal for increasing the wealth of all social well beings in sustainable, especially the community of the local society that domiciles in the area of watery (the river). Therefor, in the use of resource of public watery, the aspect in the ecology of the thing of the resource perpetuation and ecosystem functions must be paid attention as the main ground for reaching the wealth.

## 5. Conclusion

Based on the result of the research that has been done, so some things can be concluded that are related with the local genius in the tradition of *Lubuk Larangan* in the Village of Tanjung Belit as followings:

1. The tradition of *lubuk larangan* of Tanjung Belit Village directly has aroused the conciousness of the society to maintain the forest and the river. Moreover, the region is

- in the area of wildlife reserve of Bukit Rimbang Baling that is rich of nature ecosystem that is still natural.
2. The management of this lubuk larangan is implemented in together by the society, the village elders, and the set of village. The function of Lubuk Larangan for the villager of Tanjung Belit namely: the economy function, social function and integration and the environment perpetuation function.
  3. Being valuable, every harvest of fish, the society can obtain the income from the catching result, by selling the catching result to the society that comes from other villagers that come to visit. Besides that, the catching result will be also devided to every inhabitant in order to fulfill the daily food needs.
  4. The values of social and integration, the tradition of fish harvest of lubuk larangan is the hereditary tradition of Tanjung Belit villagers, among the uses from this lubuk larangan is tighten the friendship and the integration among the villagers and defend the tradition values of the nation suc as customs and traditions, discussion, cooperationand social solidarity. When the fish harvest, the assistance fund is also implemented by the society, allocated to help the mosque building, helping the orphans and the old widows.
  5. The environment perpetuation, the fish that can be caught to consumption or auction namely the fish that has big measure about minimum four fingers or 250 gram/fish. The goal is the fish that has small measure is given the chance to be big and able to lay eggs so that the fish in the watery are not used up or the generation is broken off. Besides that, the fish catch may not use the chemical material that can damage the river ecosystem. Keeping the vegetation in the edge of the river is also practiced by the villagers of Tanjung Belit not by cutting the forest at random.

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# Urgency of Port Management Arrangements in Supporting Flows of Export-Import Goods in Belawan Ports

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**Abstract.** The role of the port is an important cause in an economic development, especially in supporting the smooth flow of import-export goods to and from ports. The importance of the port's position and role, port management and operations must be truly capable of offering excellent port services. To be able to realize the excellent port service, the role of all stakeholders in the port, whether related government institutions, business entities, and port service providers, as well as the business world of port service users, especially in export-import activities, needs to be arranged in sync, so that each institution can synergize to improve port performance. With exist various and parties who are both operating in ports where each other interrelated, for harmony and smooth functioning of each is required an effective rule of law, which can cut the sectoral barriers of each institution to improve the smooth flow of import-export goods at ports.

## 1. Introduction

Legal aspects of international trade such as export-import activities cannot be ignored. The smoothness of the export-import trade of goods depends on the rule of law which becomes the instrument of procedures for the procedure of expenditure and the importation of goods which become the object of the trade from and / to the jurisdiction of the Republic of Indonesia.

To anticipate progress in the economic field, and to increase the progress of trade traffic, both nationally and internationally (globally and regionally), Indonesia needs a new legal instrument that can solve the development economic and commercial problems of law.<sup>1</sup> Advances in the economic sector, especially in the international trade sector (export-import) must be supported by legal instruments that applicable in our country, both civil and public.

In order to support the implementation of international trade, the legal instruments must be functioned effectively as a driving factor for the smooth flow of import-export goods. New law rules, according to Sunaryati Hartono<sup>2</sup>, is an economic law largely no longer adheres to the principles of civil law as well as conventional public law, but with the emergence of new needs arise also new rules and new institutions that are difficult to categorize into the system of civil law and legal system international public.

Each country seeks to increase its export of goods to other countries in the framework of its foreign trade<sup>3</sup>. Export destination countries sometimes prevent imports in their countries by using the GATT /

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<sup>1</sup> Muhammad Sood, *Hukum Perdagangan Internasional*, Cet. I Jakarta, Rajawali Pers, PT. Raja Garafindo Persada, 2011, Vol. 9.

<sup>2</sup> Sumaryati Hartono, *Hukum Ekonomi Pembangunan Indonesia*, Cet. Pertama, Bandung. Bina Cipta, 1982. Vol. 1.

<sup>3</sup> Erman Rajagukguk, *Butir-butir Hukum Ekonomi*, Cet. I. Jakarta; Lembaga Studi Hukum dan Ekonomi; Fakultas Hukum UI, 2011. Vol. 45.

WTO provisions<sup>4</sup>. As one of the countries that have become a member of international trade organizations, Indonesia is bound to comply with the provisions of international trade agreed in GATT / WTO negotiations<sup>5</sup>. These provisions have in some way influenced the national legal system and institutions in the trade sector<sup>6</sup>. The influence is inevitable, especially develop the national economy, because Indonesia has adopted a free trade system since the signing of the Uruguay Round which ended in Marrakech (Marocco) on April 15, 1994<sup>7</sup>.

As a support, the Indonesian government should be able to find a direct policy in the field of law concerning international trade. Therefore, Indonesia should develop legislation that supports the activities of international export-import trade by always protecting the national interest. To face the era of globalization in the economic sector, especially in the activities of international trade, import-export should be completely available national legal instruments in addition to international legal instruments that have been born from various agreements that can ease the flow of import-export goods, especially in the seaports as the gateway in and out of import-export goods from the Indonesian customs area.

Port<sup>8</sup> as a gate in and out of import-export goods has an important role in supporting the smooth flow of export-import goods. Given the important role of ports in export-import activities, ports need professional handling and management. In order to support the professionalism of port handling and management, the readiness and effectiveness of the legal regulations on which port management is required.

The port as a "terminal point"<sup>9</sup> for ships that will embrace import-export goods becomes an integral part of the system of economic development and international trade. The opinion of H.A.Abbas Salim, it is generally accepted that ports have functions<sup>10</sup> :

- a. Interface, the Port as meeting place of two modes/transportation system such as sea transportation and land transportation. That means that the port must give various facilities and services needed for the transfer of goods from ships to land transportation or vice versa.
- b. Link, the port is the link of the transportation system. As a chain, the port (both seen in performance and cost) will affect the overall transportation activities.
- c. Gateway, the port function as a gate from a country or region. The notion the port as a gateway can show in terms :
  - 1) The Port as the entrance or the exit of goods from/to the country or region. In this case, the port functioned very importantly for the economy of a country or region.
  - 2) The Port as gateways of ships entrance shall obey the constitution of the country/region to which the port is located, namely the provisions of Customs, Immigration, Quarantine, export-import regulations and onwards.
- d. Industry Entry, develop an export-oriented industry from a country/region, the port function is increasingly important.

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<sup>4</sup> Ibid

<sup>5</sup> Muhammad Soed, Op.,cit. hal. 13.

<sup>6</sup> Ibid

<sup>7</sup> Ibid

<sup>8</sup> The port is a place consisting of land and surrounding waters with certain boundaries as a place of government activity and economic activity, used as a vessel leaning, anchored, up and down passenger and / or loading and unloading of goods equipped with service safety facilities and port supporting activities as well as a place of transport of infra and intermodal transport (Government Regulation Number 69 Year 2001 on the Port).

<sup>9</sup> Hasim Purba, *Hukum Pengangkutan di Laut, Perspektif Teori dan Praktek*; Medan, Pustaka Bangsa Press, 2005. Vol. 177.

<sup>10</sup> H. A. Abbas Salim, *Manajemen Pelayaran Niaga dan Pelabuhan*, Jakarta. Pustaka Jaya, 1994, Vol. 44-45.

Given the importance of the role of ports in supporting the smooth flow of import-export goods, it is necessary to support the readiness and effectiveness of the legal rules relating to the management of port functions. Based on the background, it is necessary to have a scientific paper on the topic " Urgency Of Management Arrangements in Belawan Port".

## 2. Result and Discussion

### 2.1. The Role of Ports in the Smooth Flow of Imported Goods

The term international trade or so-called trade among nations, first known in the Continent of Europe then evolved in Asia and Africa<sup>11</sup>. International trade or international business is absolutely implemented by the inter-state because no nation/country in the world can meet all its own needs. Therefore, the activities of international trade, especially the import-export of goods between countries become part of international life.

Relations between companies, especially the form of international trade continues to grow. The international sale and purchase agreement are known as an import-export agreement<sup>12</sup>. Export Activities is the activity of issuing/delivering goods from the territory of Indonesia to abroad, and while Import is the activity of importing goods from abroad into the territory of the Republic of Indonesia are all implemented in international trade relations. Furthermore, according to Law Number 2 in the Year 2009 on Indonesian Export Financing Institution<sup>13</sup>, it is explained that exports are activities to remove goods from Indonesia customs areas and/or services from the territory of the Republic of Indonesia. Meanwhile, imports are activities of importing goods from abroad into the Indonesian customs area.

The rapid development of international trade relations requires legal rules that govern all rules and rights and obligations of the parties as legal subjects of international trade. These international trade actors are often called exporters and importers. Anticipating progress in the economic field, and the continued advance of trade traffic, both nationally and internationally (globally and regionally), Indonesia needs new legal instruments that can address the growing legal and economic issues of trade and commerce today<sup>14</sup>.

International trade is no different from the exchange of goods between two people in a country, the difference that the international trade of one person happens to be in a different country<sup>15</sup>. In conducting international trade activities, business actors refer to international legal norms, both private international law, and public international law<sup>16</sup>.

The rules of international law governing international trade issues, called international trade laws, are rules of international law governing the exchange of goods, services, and capital between residents of a country and another, or which occurs between two or more citizens or residents (subject laws) of different countries<sup>17</sup>. Each country has different rules and trading systems. Those bound in import-export transactions are exporters and importers or parties directly or indirectly involved<sup>18</sup>.

In international trade practice, exporters and importers will be known by various government agencies/institutions that offer services for the smooth flow of export-import goods. One of the things to be considered in export-import activities is the role and function of relevant agencies in supporting the smooth flow of goods, namely ports as the gateway to the entry of import-export goods from and /

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<sup>11</sup> Muhammad Soed, Op.,Cit. Vol. 7.

<sup>12</sup> Adrian Sutedi, *Hukum Ekspor Impor*, Penerbit Swadaya Grup. Jakarta. Muhammad Soed, Op.,Cit. Vol. 18. 7.

<sup>13</sup> Read Also Law Nnumber 2 In The Year 2009 About Indonesia Export Financing Institutions.

<sup>14</sup> Muhammad Soed, Op.,Cit. hal. 9.

<sup>15</sup> Hadi Prayitno dan Budi Santoso, *ekonomi Pembangunan*, Cet. Pertama, Ghalia Indonesia, Jakarta. 1996. Vol. 257.

<sup>16</sup> Muhammad Soed, Op.,Cit. Vol. 18.

<sup>17</sup> Ibid

<sup>18</sup> Adrian Sutedi, Op.,Cit. vol. 16.

to the Indonesian customs area.

The port as a terminal point for the ships is the main and part of the economic system because of its role as a support for the development of industry, trade, and shipping<sup>19</sup>. One thing that must be considered in supporting the smooth flow of import-export goods in the port is how the services of various relevant agencies in the port to support the export-import activities. The forms of service include service provision administrative formalities licensing import-export, as well as physical management services import-export goods at the port.

In addition to functioning to support the national economy, the port also serves to support international trade traffic<sup>20</sup>. In its position as an international traffic, then the port has legal status and held agreements with other countries for the interests of the country itself, then the traffic must be smooth. Warehouse accommodation should be good, regulations should be uncomplicated and kept away from any formality that takes time and money<sup>21</sup>.

Broadly speaking the port has a role, among others:

1. To serve the needs of international and regional trade (hinterland) where the port is located.
2. Helping the turning of trade wheels and the development of regional industries.
3. To accommodate the increasing market of international traffic flow (traffic) both transshipment and inland (inland routing).
4. Provide transit facilities for the hinterland or neighboring regions/countries<sup>22</sup>.

One thing to consider in supporting the smoothness of sea transport in a port is how to work unloading goods from one link to another chain. The strength of this chain is determined by the weakest and endless link will move as fast as the slowest moving parts<sup>23</sup>. Thus, the weakness of one chain will lead to the emergence of chain reaction<sup>24</sup>. If the port become the weak chain, the chained reaction can be an increase in the volume of the goods flow or the decrease in port productivity which will result in the queue of ships waiting at the dock<sup>25</sup>. The existence of this queue of vessels will result in lower work of port laborers and result in delayed delivery of goods to the recipient of goods, which will incur congestion<sup>26</sup>.

The congestion in the service activities of import-export goods flows at the port will have a negative impact on the national economy and the availability of goods in the market and will cause economic losses for export-import players which will ultimately harm the nation's economy. Therefore, in supporting the smooth flow of import-export goods, the port must be able to act effectively and efficiently.

A port can be effective and efficient if the ship does not wait long at sea, can undertake loading and unloading of goods quickly and smooth (quick dispatch) and supported by facilities equipment or facilities and adequate infrastructure, because it is very important for shipping companies.

To support the smooth flow of import-export goods in the port, and the adequacy of facilities and

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<sup>19</sup> Pedoman Pembangunan Pelabuhan, Terjemahan dari Port Development Handbook, UNTAD, Dep. Hub. Dirjen Hubla, Dirjen Pelabuhan dan Pengerukan, Japan International Cooperation Agency, dalam Elfrida Gultom, *Refungsionalisasi Persada*. Jakarta, 2006. vol. 5.

<sup>20</sup> Hasim Purba, Op., Cit. vol. 178.

<sup>21</sup> Ibid

<sup>22</sup> Ibid, vol. 180.

<sup>23</sup> Elfrida Gultom, *Refungsionalisasi Pengaturan Pelabuhan Untuk Meningkatkan Ekonomi Nasional*, Raja Grafindo Persada. Jakarta, 2006. vol. 7.

<sup>24</sup> Ibid

<sup>25</sup> Ibid

<sup>26</sup> Ibid

infrastructure, an effective and efficient port is also inseparable from the professionalism of all stakeholders and related institutions that offer ideal services in the smooth flow of import-export goods at the port. One of the things that must be considered is from the aspect of the readiness of the rule of law and the effectiveness of the rule of law as well as the commitment of all port service agencies in supporting the smooth flow of goods in and out of the port.

## *2.2. Implementation of Port Services*

In supporting the smooth flow of import-export goods in Belawan Port as it is known that port function is very strategic in supporting export-import activities. Ports as gateways in and out of goods from/to customs areas in the port are highly dependent on the quality of port services. Port services shall include anything related to operate ports and other activities in carrying out port functions to support the smooth, safe, and orderly flow of vessels, passengers and/or inter-modal and encourage national and regional economies.

Referring to the urgency of the port role, the port is an important production branch for the state and which controls the livelihood of the masses dominated by the state<sup>27</sup>. This is under the mandate of Article 33 Paragraph (2) of the Constitution of Republic Indonesia in The Year 1945. Therefore, the constitutionally port management should be really directed to the national interest, including in promoting the national and regional economy to prosper the nation. From the constitutional mandate, various laws and regulations formulated for the basis of port management should be really as implement the constitution.

Various legal products have been issued as the basis for port management, namely Law Number 17 in the Year 2008 on Shipping; hereinafter issued Government Regulation Number 61 in the Year 2009 on Port, which further followed by arrangement through Regulation of Minister of Transportation of RI Number: PM 51 in the Year 2015 About Port of Sea Operation.

Port management conducted by State Enterprise PT (Persero) Pelabuhan Indonesia I operates 2 (two) ports namely Belawan Ujung Baru Port and Gabion Belawan Container Terminal managed by Belawan International Container Terminal. Both business units are under the leadership of PT (Persero) Pelabuhan Indonesia I Medan.

From the handling of export-import goods handled by both business units in reality there is a difference, in which case PT Pelabuhan Indonesia I Belawan Branch handles loading and unloading of various types of packing of goods, including bulk liquid and dry bulk goods unloaded from and / to ship on docks in the working area of PT Pelabuhan Indonesia I Belawan Branch. Various types of goods such as conventional goods, with packaging sacks, crates, dry bulk, non-container liquid bulk is generally done in the working area of Pelabuhan Indonesia I Belawan.

To serve the needs of service users especially in serving export-import activities, PT (Persero) Pelabuhan Indonesia I Belawan Branch has implemented 24 hours/day work system or by determining the target volume of work that must be achieved by the stakeholders, especially the parties associated with export-import activities.

But in reality, the target work and work system 24 Hours / Today still often get obstacles in its application. The constraints are not only from the internal port but often faced is the constraint of the readiness of performing parties outside the port environment such as: in the import activity.

1. The preparedness of trucking to transport goods dismantled from ships to be transported outside the port area
2. The readiness of a warehouse or place of cultivation of goods in Line II or warehouse receiver of the importer

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<sup>27</sup> Read More Article 33 Paragraph (2) of the Constitution of Republic Indonesia in The Year 1945

3. The readiness of the loading and unloading Workers (TKBM) or other workers and workers at the receiving warehouse location
4. The readiness of equipment such as (crane tool, weighing instrument) in the warehouse or the area of receipt of goods

Some of these constraints, in general, will directly affect the performance and smooth flow of goods to and from Belawan Port. The unpreparedness of supporting factors outside the port area as a whole result in a decline in port performance, even stagnation, or congestion at ports that lead to high Dwelling Time<sup>28</sup> at the ports of the largest limit set by the government. Dwelling Time that exceeds a predetermined limit will impact on things like.

1. The scarcity of goods in the market and result in soaring prices that ultimately burdensome for society
2. Vulnerable to abuse of authority by the parties related to authorizing port service for export-import of goods
3. Disrupt develop the economy nationally and regionally.

In addition to external factors, internal factors in PT (Persero) Pelabuhan Indonesia I Belawan branch also required anticipation forwards like

1. Working system arrangement of Manpower Loading and Unloading (Tenaga Kerja Bongkar Muat/TKBM) is complete and assertive.
2. Peer compliance for all agreed work goals
3. The addition and improvement of port facilities
4. Improvement and refinement of administrative services in all related agencies using IT services

Similarly, information on BICT's unit that provides port services for export of goods transported by containers has provided the right service for service users. However, the implementation of the 24 Hour / Day work system in practice still faces certain factors from the workers / warehouse / container accumulation area at the receiving site before the Gabion Belawan port area.

The unpreparedness of the exporter-importer company in compensating the 24 Hr / Day system implemented at BICT will have a direct impact on BICT's performance, including trucks carrying out from Belawan Port will be congested due to lack of the same services. Container deposition area outside the port area. This will also result in reduced revenue at lower levels from truck operators and trucking vehicles.

### **3. Conclusion and Recommendation**

#### *3.1. Conclusion*

Ports have an important and strategic role in supporting the smooth flow of import-export goods, in order to support economic development, must be regulated in accordance with the mandate of the constitution, namely Article 33 Paragraph (2) of the 1945 Constitution. Given the urgency of ports, is controlled by a state whose execution may be a state-owned enterprise specifically established for it, in this case PT (Persero) Pelabuhan Indonesia I Medan which directs the business unit of Pelabuhan Indonesia I Belawan Branch and business unit of PT Belawan International Container Terminal BICT), must still be able to provide excellent service to the users of seaport services in import-export activities.

Current arrangements concerning seaports provided for in Law Number 17 Year 2008 on Shipping; Government Regulation Number 61 in the Year 2009 Concerning Port and Regulation of the Minister of Transportation Number: PM 51 in the Year 2015 Concerning the Implementation of Sea Ports shall be the basis for the provision of port services for port service users, especially in the export and import activities of goods to and from Belawan Port .

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<sup>28</sup> Dwelling Time or loading and unloading time of goods to and from ships at port.

### 3.2. Recommendation

Considering the existence of obstacles faced especially in implementing work system 24 Hours / Day at Port Belawan, among others, external port factor that is unprepared hours of work, labor and warehouse facility; the area of accumulation of goods in the area of line II, it is necessary to coordinate all across all stakeholders in order to achieve a mutual agreement and commitment in support of 24 Hours work system to improve the performance and efficiency of costs at the port, so as to support the smooth flow of import-export goods in Belawan Port.

### The acknowledgements

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# The Determinant Factors In The Implementations Of The Virtual Office Administration (siMAYA) System In The Secretariat Of West Sumatera Province

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**Abstract.** The Maya Office Administration (siMAYA) System is a system application that is connected to the network and can be accessed by all users with coverage: external communication systems, internal communications, dispositions, and letter-making with templates, the forms are equipped with workflows for incoming letters, dispositions, and outgoing mail. SiMAYA application has been planned to be implemented at the Secretariat of the Province of West Sumatra, but of course there are still many possible constraints such as lack of human resources, limited facilities and infrastructure and others. The purpose of this study is to see what factors are involved in implementing the SiMAYA application at the Secretariat of the Province of West Sumatra. This study was a qualitative research using descriptive methods. The informants in this study were determined by purposive sampling technique. The witer collected this data by observing, documenting studies, interview quiddelines an field notes. The technique of testing the validity of the data by triangulation while the data analysis technique used was data collection, data reduction, data presentation, and conclusion drawing. The results showed that there are factors in the implementation of the Maya Office Administration (siMAYA) System including (1) lack of quality human resources, (2) inadequate technology, and (3) unclear relations.

## 1. Introduction

Along with the development of information technology (IT) office administration providers, especially in government institutions or agencies which are usually carried out manually or conventionally, now there is the latest one called E-Government. In bureaucratic reform, especially for management aspects, office administration management can be done with the help of information technology is electronic office information. In building E-Government, in the Office of the Governor of West Sumatra Province by conducting the first socialization related to the electronic service manuscript through the Virtual Office Administration System application (siMAYA) throughout the OPD in the Secretariat of West Sumatra Province in April 2016 by the Public Relations Bureau in the field telecommunication and information of the Secretariat of West Sumatra Province.

On June 19, 2019, the application of the Virtual Office Administration (siMAYA) System was re-socialized for all OPDs in West Sumatra Province, the last of which was held in August 2017 by the Department of Communication and Information of West Sumatra Province. Information technology is an absolute necessity so it needs to be applied E-Government. One of them is through the electronic service script with the siMAYA application made by the Indonesian Ministry of Communication and Information. The siMAYA implementation is a web or cloud-based office administration application. With this application the mail management process which is usually done manually can be done automatically, making it easier in the administration process, search and archiving. The benefits of this siMAYA application include saving resources such as power, paper, time, and costs as well as the efficiency of budget savings.

The implementation of the Virtual Office Administration (siMAYA) System has been adjusted to the Circular of the Minister of Administrative Reform and Reform Number 5 of 2013 concerning the Use

of Electronic Service Script Applications at Government Agencies. There are other policy bases, among others, the Information and Electronic Signatures Act, PP for the Implementation of Electronic Transaction Systems, and the Regulation of PAN and RB No. 80 of 2012 concerning Official Manuscripts.

In implementing the siMAYA program, there are obstacles in its implementation, among others, the regulation itself, because this regulation regulates all PNS employees to use this siMAYA application, but the realization is still not implemented by the employee. In addition, there is no support from related parties to utilize the siMAYA application, this is due to lack of supervision or the absence of involvement from the party responsible for implementation within the organization so that the affairs in office administration are still done manually.

In accordance with the results of the author's interview in June 2017 with the admin application of siMAYA in the Administration Section of the West Sumatra Provincial Secretariat General Bureau revealed that the constraints in the implementation of this application were the first preparation of existing human resources. There are some employees who do not have android phones in general, and some are not able to use them, this is due to the lack of knowledge of employees in the field of information technology. Second, the training provided was less intensive. Because the training conducted is intended only for the leader and also the administrative staff appointed as the admin or operator in the siMAYA application. Third, some employees consider the policy to only add to their duties. And fourth, lack of infrastructure support such as available networks. In its realization in the application of the siMAYA application to facilitate the work of ASN employees in working anywhere and anytime effectively and efficiently.

Based on the background of the above problems, the author has conducted research in West Sumatra Province about the determinant factors in the *implementation* of the virtual office administration (siMAYA) System in the Secretariat of West Sumatra Province. The formulation of the problems raised in this study are as follows: *What are the determinant factors in the implementation of the Virtual Office Administration (siMAYA) System in the Secretariat of West Sumatera Province.*

## **2. Review of Related Literature**

### *2.1 E-Government*

According to Tata Sutabri (2016: 294), E-Government is the use of information technology that can improve relations between the government and other parties. The use of information technology then produces new forms of relationships such as:

1. G2C (Government to Citizen)
2. G2B (Government to Business)
3. G2G (Government to Government).

Whereas E-Government according to the World Bank, namely the use of information technology by government agencies that have the ability to realize relations with citizens, business people, and other government institutions. E-Government according to Presidential Instruction No.3 of 2003 concerning National Policy and Strategy for E-Government Development, that e-government development is an effort to develop governance based on (using) electronics in order to improve the quality of public services effectively and efficiently.

In addition, the purpose of implementing E-Government is to achieve good governance. Good governance has elements (Tata Sutabri, 2016: 197-298), namely:

1. Participation
2. The rule of law
3. Transparency

4. Be responsive
5. Build consensus
6. Equality
7. Effective and efficient
8. Responsible
9. Strategic vision

The purpose of e-government according to Any Indri Hastuti (2014), among others, is:

1. Better service
2. Community empowerment through the ease and adequacy of information
3. Establish an interactive relationship with the business world to deal with changes and competition in international trade
4. Establishment of mechanisms and channels of communication with state institutions and provision of public dialogue facilities
5. Information disclosure
6. Implementation of government activities in a more effective, efficient and accountable manner.

In addition, the benefits of e-government according to Any Indri Hastuti (2014) include:

1. Improving the quality of government services to the community and other national communities
2. Improve the process of transparency and accountability in government administrators
3. Reducing transaction costs, communication and interactions that occur in the governance process
4. Creating a better quality community based information community.

## 2.2. *Management information System*

Management Information System according to Tata Sutabri (2016: 83), management information system is an integrated human or machine system to present information to support the functions of operations, management, and decision making in an organization. This system uses computer hardware and software, guidelines procedures, management models and decisions, and a data base. While SIM according to Robert W. Holmes in Danang (2014: 5), is a system designed to present selected information oriented to decisions needed by management to plan, supervise, and assess organizational activities.

Computer-based SIM according to Sutabri (2016: 91-92) contains the following elements:

1. Humans
2. Hardware
3. Softwar
4. Data
5. Procedure

According to George M. Scott in Deni Darmawan (2013: 14), the properties of SIM, namely a) a comprehensive system, b) a coordinated system, c) have an information subsystem, d) a rationally integrated system, e) change data become information in a variety of ways, f) increase productivity, g) according to the style and characteristics of the manager, h) using existing quality criteria.

Use / function of information systems (Eti Rochaety, 2017: 12), among others are as follows:

1. Increasing the accuracy of data presented in a timely and accurate manner for users, without requiring an intermediary information system.
2. Ensuring the availability of quality and skills in utilizing information systems critically.
3. Develop an effective planning process.
4. Identifying the needs for information system support skills.
5. Improve productivity in system development and maintenance applications.
6. Organizations use information systems to process transactions, reduce costs and generate income as one of their products or services.

There are characteristics of Management Information Systems (Deni Darmawan, 2013: 7) as follows: Quantity of Information, Quality of Information, Actual Information, Relevant Information, Information Provisions, and Truth Information. There are three main keys in supporting information technology that can be used as government assets in the long term (Eti Rochaety, 2017: 29-30), namely:

1. Human Resources, namely staff responsible for technology planning and development in all governments. HR factors that become staff of information technology development in the company / government are technical expertise, knowledge of the business world and orientation to problem solving.
2. Technology, all information technology infrastructure, including hardware (hardware) and software (software) are used together in government operations. The resulting information system will have reliable, accurate and consistent potential.
3. Relations, is the relationship of information technology with company management as decision making. Establishing a relationship means sharing risks and responsibilities. In realizing this relationship must be supported by the highest leadership of the government so that it will be responsible for information technology applications that are process oriented not based on organizational functions.

While the factors that influence the implementation of information systems are divided into three according to Sugianto Hartono in Hidayat (2011), including:

1. Technical errors, problems occur due to hardware problems, errors in writing syntax or software logic errors.
2. Environmental disturbances, can be earthquakes, electrical failures due to lightning, fire. high temperatures, and water, then floods and winds.
3. Human negligence, which is accidentally included in environmental disturbances, because it uses incorrect data and accidentally deletes data.

### 2.3. *The Virtual Office Administration (siMAYA) System*

The SiMAYA program is an implementation of the electronic service script. siMAYA is an e-office application that has been refined from the previous e-office application. SiMAYA application is a system application that is connected to the network and can be accessed by all users with coverage including other external communication systems, internal communications, dispositions, and letter making with templates / forms equipped with workflow for incoming letters, dispositions and outgoing mail (Any Indri Hastuti, 2014).

**Table 1 Transition in Cultural Change**

Conventional	SiMAYA
<ul style="list-style-type: none"> <li>• Work must be in the office</li> <li>• Old disposition process</li> <li>• Eating a lot of costs such as paper, ink etc.</li> <li>• Need storage for document / archive storage</li> <li>• Physical archives can damage</li> <li>• Dependence on office facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Efficient, effective working anywhere</li> <li>• Disposition is real time</li> <li>• Save on financing or</li> <li>• Electronic storage</li> <li>• Mobile application technology</li> </ul>

*Source: Dirgantara Manurung Pranata 2013*

There are four types of user type classifications in siMAYA (Source: User Guide on How to Use the SiMAYA Application), namely:

1. Leader Leadership function: receiving incoming letters, disposing of letters, and letter signatures.
2. Administration Administration function: scan physical entry letters, receive and schedule incoming letters, and send and scheduled outgoing mail.
3. Ordinary Users / Employees Function of ordinary users: accept dispositions, send dispositions, draft letters, and examine the concept of letters.
4. Admin / Local Admin Local admin function: create organizational structure, create job names, create users, and manage users.

In the case of using the format of official manuscripts regulated in the Regulation of Menpan & RB Number 80 of 2012 concerning Guidelines for Managing Manuscripts. Official guidelines for government agencies are prepared based on the following principles:

1. Effective and Efficient  
 The implementation of official manuscripts needs to be carried out effectively and efficiently in writing, use of space or official manuscript sheets, information specifications and in the use of Indonesian language that is good, correct and straightforward.
2. Freezing  
 Official manuscripts are processed and arranged according to the procedures and forms that have been frozen.
3. Accountability  
 The implementation of the official script system can be accounted for in terms of content, format, procedures, authority and validity.
4. Linkage  
 The implementation of official manuscripts is carried out in a single system of general administration.
5. Speed and Determination  
 Official manuscripts must be completed in a timely, fast, targeted manner in editorial, procedural and distribution.
6. Security  
 Official manuscripts must be safe in the formulation, classification, conveying to those entitled, filing, filing and distribution.

Decree of the Governor of West Sumatra Number 480-471-2015 Regarding the Appointment of the Administrator of the Maya Office Administration System Application in West Sumatra Province, there are administrator duties, including:

1. Provincial Government Administrator:
  - a. Create a hierarchy of the Provincial Government's organizational structure in the application
  - b. Create hierarchy of job structure and user account (user) Governor / Deputy Governor in the application
  - c. Arranging the authority of the Governor / Deputy Governor in the application
  - d. Set administrator authority in each SKPD on the application.
2. Administrator of the Regional Work Unit (SKPD):
  - a. Create organizational structure hierarchies in SKPD on applications
  - b. Make hierarchy of job structure and user account (user) in SKPD on the application
  - c. Set the authority of the user in the SKPD on the application.

Followed by the Circular of the Governor of West Sumatra Number 493 / SE / Humas-2016 concerning the Use of the Electric Service Manuscript Application (siMAYA) in the Government of West Sumatra Province.

### **3. Research Methodology**

This research is a descriptive analysis that is used to find out, analyze, and describe the determinant factors in the implementation of the virtual office administration (siMAYA) system at the Regional Secretariat of West Sumatra Province. The informants used in this qualitative research used purposive sampling technique, sources that can really provide information. Data collection techniques used are interviews, documentation studies, observations while for data validity testing techniques used are triangulation. In this qualitative research, data analysis techniques use the following steps, namely data collection, data reduction, data presentation, and conclusion drawing.

### **4. Discussion and Research Results**

The determinant factors in the Implementation of the Maya Office Administration (siMAYA) system in the Secretariat of West Sumatra Province, according to Eti Rochaety (2017: 29-30) include:

First Human Resources; lack of quality human resources because of its lack of ability in the field of information technology. This is due to the age factor so that they cannot use technology especially the SiMAYA application, and there are some of the employees who do not use Android phones but still use ordinary cellphones, or are called technologically cluttered or failed. In addition, it was also hampered by the socialization carried out by the parties concerned not carried out effectively and intensively because not all employees who participated in the training were given, the employees who participated in the training were given SK but even so the only participants were present, sometimes - sometimes the admin is not permanent, who is appointed to attend because the appointed administrative staff is the operator, so this is less efficient in its implementation, because the task is to become a recap of administrative staff and admin in managing this SIMAYA application. The management of the SIMAYA application should be managed specifically by operators in the field, there are also fields of business management. Even though the one who runs the SiMAYA application is all PNS employees in Setda including leaders, administration, employees, and operators.

Second Technology; judging from the implementation of SiMAYA, the infrastructure preparation and equipment equipment for the SiMAYA application are still limited and inadequate. With a budget of around 1.3 M for the network alone around 80%, and around 20% for purchasing facilities for each head of each OPD in West Sumatra Province, including mobile phones, and scans per table. In terms of existing infrastructure, the server used is only 1 (one) server, this is why the signal in this office is always slow, and the network used is still in the form of Web Base, because the capacity used in managing other office activities is wide. it is not enough, especially coupled with the existence of this SiMAYA application too. And judging from the terms of the devices used such as Asus laptop computers and tablets that are available are still limited in usage, and other devices such as the Plustek Scanner (mobileoffice S400) that are inadequate from the form of the device used once will be damaged. important to be durable in its use. In addition, there are also environmental disturbances in the implementation, such as from the existing electricity, because in the use of siMAYA depends on internet access owned by the office, so if the signal is constrained due to weather conditions such as wind, lightning, or flooding the network quickly also will slow down in electronic mail processing.

Third Relations; the relation in the SiMAYA application is unclear, this is because the gubernatorial regulation is still in the process of repairing, so the accountability is still unclear, because at first the West Sumatera Secretariat's Public Relations Bureau first held siMAYA trainings for all OPD in West Sumatera Province in in 2016 and in 2017 SiMAYA training was continued by the Department of Communication and Information of West Sumatera Province. According to the West Sumatera Provincial Office of Communication and Information, that the implementation of the SiMAYA application has not been realized properly, it is still done manually, but in the General Secretariat Bureau section it has started to use one of them by electronic mailing which is managed directly by the admin / operator. The implementation of this system is very important the role of the leader who is in charge of the implementation, but the realization is lacking some of the leaders who play a role, so there is no strict supervision or rules for using siMAYA, which makes the employee lack of use of this application.

## 5. Conclusion

Based on the results of the discussion that has been done by the author, it can be concluded that there are various the determinant factors in the implementation of SiMAYA system in the Secretariat of West Sumatera Province, namely the lack of human resources, especially in the field of information technology, the technology that is used as support in the implementation of SiMAYA is still limited and still inadequate, and unclear relations.

Looking at the determinant factors in the implementation of the virtual office administration (siMAYA) system in the West Sumatera Provincial Secretariat, the authors suggest:

1. There must be a clear relationship in the implementation of this MAYA, so that the application can be accounted for, with the encouragement and support of strong leaders.
2. There must be HR recruitment in the information technology sector, especially for the management of the SIMAYA, every OPD throughout the West Sumatera Province, and by conducting intensive and ongoing trainings.
3. There must be assistance from the National Budget in the implementation of SiMAYA, so that the existing infrastructure is able to manage this application quickly, well and precisely.
4. There must be coordination and supervision for each OPD in West Sumatera Province in the implementation of this MAYA.

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## Payment Tax Restaurant Does By Taxpayer at Batam's City

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**Abstract.** Taxeses paying performing region and restribusi, performed bases democracy principle, generalization and justice, society role where also been seen of marks sense potency that region. Directly which is not society get reward from government but society of followed to enjoy taxes facility with utilize public utility already is of service. One of taxes which indirectly been paid while expense is restaurant taxes. This writing intentionally to first, giving picture to society, to government has authority to do taxes picking and second, society is made as taxpayer. Regulation that manages about this taxes is Statute Number 28 Years 2009 about Region Taxes And Restribusi Is Regions. Method observationaling to have function as guidance in observational. Research is done that this writing gets to be utilized by common society. Observational method that is utilized is empirical research. There is data analysis even of this writing which is ala utilizes descriptive kualitatif. Data source to prop research working out is primary data source, skunder and tertiary. Location Reaserch in Badan Pengelolaan Pajak Dan Restribusi Daerah inisial is BP2RD. First observational result, local government that have task to do taxes picking have power and kewenangan does taxes picking because of be managed in prevailing regulation; both of, society that goes along to enjoy public utility, well that frequent utilizes or even that rare utilizes, under obligation also to pay taxes.

### 1. Introduction

#### 1.1 Background Of The Problem

In the tax collection area, local government issued a regulation the tax adjusted with Act Number 28 the Year 2009 about regional taxes and levies area. Based on Article 1 number 10 ( Tax is compulsory contributions to the regions that terutang by the personal or body which is forced based UndangUndang, with did not get the reward directly and used for the need of the region for sebesar-besarnya the prosperity of the people. In this rule there are some types of tax Districts listed in Chapter II Tax, namely in Article 2 number 2 that one only in letter b is the restaurant tax. BPPRD Batam city that has the authority to do the tax is as much as 10%. According to the discussion of the above, Researcher Team quoting the title overview of Tax.

Regional tax is one of the components of the revenue used to finance the need of the region. One type of tax to include in the regional tax is tax restaurant. Restaurant tax is a tax imposed on the local government efforts are engaged in services cuisine, best consumed elsewhere are business or in other places. Restaurant tax managed by local government as a source of regional acceptance. local government was given the power by the central government to manage the potential areas that can be made the acceptance from the tax sector area, including the management of the restaurant tax therein <sup>29</sup>. With the issuance of the policy on regional autonomy, then each district is required to be able to explore

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<sup>29</sup> Ichwan Albi Priests Suyadi Sri Sulasmiyati, 'Evaluating the Implementation of tax inspection restaurants as part of the effort to tax revenue optimization restaurants the City Administration of West Jakarta', 11.1 (2016), 1 of 9 <taxation.studentjournal.ub.ac.id%0A3>.

the potential for acceptance of the owned by the local. The potential for the acceptance of the intended area is regional taxes. The acceptance of regional taxes must be maximized because of the regional tax is a source in the process of regional development. Restaurant tax including in regional taxes and participate to the financing of the way the wheels of the local economy so that the process of pemungutannya should be monitored with better so that the acceptance of the tax produced can describe the potential for a real area. Huge tax potential can be known when the realization that occurred is greater than the target for the specified when the value of the realization that occur smaller than the target means the implementation of tax collection is still not used by a maximum of <sup>30</sup>.

One of the strategic sector for tax collected is an advertising sector. Billboards is a media promotion of goods and services that are currently enough dimina by businessman almost in all cities in Indonesia. According to Berhouver, billboards is each statement that consciously intended to the public in the form of anything that is done by one of the participants of the trade traffic that is directed toward the target zoom in the sale of goods or services entered by the <sup>31</sup> stakeholders in the business. <sup>32</sup>

Restaurant tax, tax billboards and road illumination tax potential enough in contributing original regional income. To optimize the tax tax, restaurants billboards and tax explanation of the way it needs to be done the calculation of the regional tax revenue is accurate. The District Government of Minahasa North each year have targeted in tax revenues, some namely taxes tax, restaurants billboards, tax and the explanation of the way as a source of income Minahasa district north. This tax third is a potential sector so that with a potential is expected to increase in the realization of tax revenue tax, restaurants billboards, tax road illumination and contributions given by the three this tax could spur economic development in the district of Minahasa North America especially and North Sulawesi Province in general. On various literature discusses the public financing, tax is the main source of payment of government spending. As noted by the Kaho (1990), tax is the transition of wealth from the people to the state coffers to pay for routine expenses and surplusnya used for public saving which is the main source in membiayai public investment. The purpose of tax assignment is to redirect economic resources control from the required to the state in terms of use or transfer to another taxpayer . <sup>3334</sup>

Restaurant tax is a tax on the services restaurants. Restaurants are the place of eating food and drinks provided by collected for payment (Darwin, 2010: 120). Restaurant is the provider facility and food or drink with free byaran which also includes the house eat, cafeterias, canteen, warung, bar and similar substances including services cuisine/katering [28]. Local Regulation of Bandung City Number 20 Year 2011 explained that the restaurant tax is a tax on the services provided by the restaurant. According to the Regulations of the city of Bandung Number 20 Year 2011, Restaurants Tax object is the services provided by the restaurant. The services provided include restaurants sales services and food or drink consumed by the buyers best consumed in the services or in other places and that does not include restaurants tax object is the restaurant penjulannya values below Rp. 10,000,000 (ten million rupiah per month. According to the Regulations of the city of Bandung Numbe 20 Year 2011, restaurants tax subjects is the personal or agencies that buy food and or drinks restaurants. Taxpayers conference is the individual or body that cultivate the restaurant. Local Regulation of Bandung City Number 20 Year 2011 [9], the basis of tax imposed conference is the number of payments received or should have

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<sup>30</sup> Diana Beautiful Pertiwi and Evi Yulia Purwanti, 'tax potential Analysis restaurants in the tourist area Anyer Serang district', 3.1 (2014), 1 of 8 <<http://ejournal-si.undip.ac.id/index.php/jme>>.

<sup>31</sup> Amelia Cahyadi, 'Separation of local regulations on taxes and the permissions of billboards as an effort to maximize tax revenues', *law science journal*, 4.1 (2017), 84-103 <<http://dx.doi.org/Doi:h?ps://doi.org/10.22304/pjih.v4n1.a5>>.

<sup>32</sup> Nugrahini Kusumawati and Siti Saroh, 'Increased Local Revenues Serang district table . 6 Target and the realization of the restaurant Tax Serang district 2009', *JBBE*, 7.2 (2014), 27-33.

<sup>33</sup> Alfian Lamia, 'Analysis of the effectiveness and contribution of the analysis of Effectiveness Voting and Contribution's Tax Restaurant , Advertising Tax and Street Lighting Levy District', *journal Scientific Newsletter Efficiency*, 15.5 (2015), 788-99.

<sup>34</sup> Khairunnisa, 'Taxes Hotel And Restaurant taxes as a source of local revenues ( PAD )( Case Study : the city of Bandung )', *Planning Journal region and the City of*, 22.3 (2011), 227-244. P. 835). 229.

received the restaurant. Restaurant tax rate specified by 10% (ten per cent). Main massive restaurant terutang tax is calculated by multiplying the tariff as with the base of the tax imposed. According to the Law - Law Number 28 Year 2009 Article 41 about taxes tax, restaurants restaurant terutang collected in the region where the restaurant is located <sup>35</sup>.

In accordance with the Law Number 28 Year 2009 Article 1 number 22 and 23, understanding Restaurant tax is a tax on the services provided by the restaurant. That meant conference is the provider facility and food or drink with free hire, which includes the house eat, cafeterias, canteen, warung bar, and similar substances including services cuisine/catering. Based on the Perda No. 16 The year 2010 about regional taxes, on Article 12 explains the sense of the object of the tax conference is the services provided by the conference covers the food and or drink<sup>36</sup> consumed by the buyer, best consumed in the services or in other places. While the subject of the tax is the individual or body that cultivate the restaurant. The Restaurant tax rate when the restaurant with the value of sales above Rp 5.000.000,00 (five million rupiah to Rp 15.000.000,00 (fifteen million rupiah per month quotes of 5 percent (five percent). When the restaurant with the value of sales above Rp 15.000.000,00 (fifteen million rupiah per month quotes by 10% (ten per cent).<sup>37</sup>

### 1.2 Formulation of Problems

Now the formulation of problems from this research is how the implementation of tax restaurant in Batam managed to gladly voting by BPPRD Batam City?

### 1.3 Theory:

Policies: that supports the tax collection of the theory that explains or provide justification giving the rights to the state to collect taxes namely:

1. The theory of Insurance: Countries protect the safety of the soul, property and the rights of the people.
2. The theory of interest: Distribution of tax burden to the people is based on the interests of (E.g. protection) each person
3. Power theory measures: tax burden for all of the people must be the same weight.
4. The theory of prostitutes: basis of justice tax collection is located on the relationship of the people with his country.
5. The theory of the basis of purchasing power: the basis of justice is located on the result of tax.

### 1.4 Ground-Ground

In the to tax to the community needs to be done based on the way the things which is reflected in the basis of tax collection, according to Mardiasmo (2011: 7), is as follows:

1. The Basis of reside  
(The basis of living place): The State entitled to wear the tax on all required Income Tax  
The dwelling place in the aquarium  
income both from within and from  
Abroad.<sup>38</sup>
2. The basis of the source: Countries  
entitled to wear the tax on income  
sourced in its region Regardless of the

<sup>35</sup> Password Engi Utami, 'Tax Influence Restaurants and Hotel to local revenues the city of Bandung (year 2009-2013)', *E-Proceeding of Management*, 2.2 (2015), 1808-1813. P. 835). 878.

<sup>36</sup> Agung Darsono Roro Bella Ayu Wandani Prasetio Princess , Srikandi Kumadji, 'Analysis of tax revenue Hotel, Tax Entertainment Tax, restaurants as a source of Local Revenues (Study On of Regional Income Malang city)', 3.1 (2014), 1 of 8 <Taxation..Studentjournal.Ub.ac.id>. P. 835). 3.

<sup>37</sup> Roro Bella Ayu Wandani Prasetio Princess , Srikandi Kumadji. *Ibid.*. p. 835). 4.

<sup>38</sup> Windy Megasilvia Mintahari and Linda Lambey, 'Analysis of the restaurant tax contribution to local revenues (Pad) Kabupaten Minahasa Selatan Years', 4.2 (2016), 641-51  
<<https://media.neliti.com/media/publications/128118-ID-analisis-kontribusi-pajak-restoran-terha.pdf>>. Hlm.643.

place of stay required taxes.

3. The Basis of nationality: tax imposed is connected with the national anthem of a country.<sup>39</sup>

## 2. Research Method

The research method used is the author of the judicial sociological. Data Collection in this research done by qualitative research and use the interview as a source of information. Now the source that is used is the primary data and using the primary data source and secondary also in collecting information.

## 3. The Discussion

Tax management book in the City of Batam submitted to the office of BP2RD or called with Tax Management Agency incurs a 'area. The Agency is working to manage and to tax where not only 1 types of Taxes but there is a type of the other taxes that are managed by BP2RD. According to the results of the interview with Mr Drs Efrius, M. Ec, Dev Management is not to be contrary to Law Number 28 Year 2009 about regional taxes and levies areas because in this rule will no longer be able to Local Government, Pemko and Pengcap loading taxes outside of which have been specified in the act. The issuance of this rule aims so that the government does not weigh on the community to the tax was clearly based on the rules that they must pay". Evidence paid by businessman book to the community and also to report to BP2RD is evidence of the pay electronic, which evidence pay this electronic followed the development of the days, so that the evidence of the pay that use stamps not used again. Based on the implementation of the previously, in the City of Batam especially on the office BP2RD not only use the regulation, but also use the bylaws and perwako to perform tax. Now the documentation for the formation of the Batam City Budget is as follows:



Figure 3.1 Batam City Budget Information

Answer other from Sir Drs. Efrius, M.Ec, Dev is Restaurant taxes payment for entrepreneur what does open resto or restoran even, made compulsory to pay taxes 10% each consumer buy that eat at restaurant or resto that. Different thing doesn't be given unto entrepreneur that its effort production under 10 million. If there is little entrepreneur that opens canteen, tetapi pemasukan of its effort less than 10 million, therefore Supervisor BP2RD gives chance up to 3 months see effort developing of that little entrepreneur.

## 4. Conclusion

The conclusion to be drawn from the explanation above is as follows: The implementation of taxes restaurants in the City of Batam managed by BPPRD City of Batam. Usually the supervisors from BP2RD down forbearance to perform pengecekan, and see rekap finance from the seller who required checked by the supervisor of the BP2RD that directly down to the book on when checking.

**Thank You**

<sup>39</sup> And Lambey Mintahari. *Ibid.*. p. 835). 644

1. Directorate General as a warner PDP Grants
2. The Rector of Putera Batam namely Dr Nur Elfi Husda., S.Kom., M.SI
3. Dosen-Dosen Law Science Study Program
4. The Secretary of the BP2RD namely Mr Drs Efrius, M. Ec, Dev
5. Tax Information System Sub Division and incurs a 'District, Suharso, S.Kom

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# Community Based Peat Land Management in Siak Regency The Riau Province of Indonesia

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**Abstract.** This peat land restoration program in Riau Province especially Siak Regency, there is activity plan as follow: (1) Rewetting Program, The rewetting activities consist of Construction of artesian wells, Canal development, Water management development (at a company), and Water management team building and training.(2) Revegetation Program, The revegetation program is a green activity area especially on burnt-out land, among others: Making of peatland village seedlings, Cultivating of seedlings from peatland villages, Making of horticultural crops, and Cultivating of horticultural crops. (3) Social Economic Revitalization Program covers: development of land fishery business, livestock development business, honey bee development business, ecotourism development of peatland, cultivation of natural plant, utilization and processing of sago pulp, mangrove crab cultivation, sustainable development of food house, development of peat moss care village. In the case of peatland restoration program, many stakeholders are involved from variety of interests to succeed peatland restoration program.

The research method used qualitative method. The purpose this research is Community Based Peat land Management in Riau Province of Indonesia. The results this research (1) Peat land restoration program is an activity to restore degraded peat soil back to its original function. The effort of peat land restoration program is still a realization from the rewetting program, which is the construction of canal blocking. Meanwhile the revegetation program, the Peat Land Restoration Agency collaborate with social institution by assisting the society has done the planting of sago seedlings like natural wood. For the revegetation program, it has not been realized due to the massive implementation for peatland restoration program, (2) Community empowerment through grant / rolling assistance need to pay attention, among others are: (1). Types of economic commodities. The selection of the right type of economic commodity will greatly affect the success of economic activity. (2). Guidance and mentoring. (3). An example of success. Support from local government is generally given to groups that have demonstrated tangible success, so that the role of counselors to communicate with local government is urgently needed; (4). Motivators in groups. there is a motivator among group members. In the group that is considered successful, there is always one member of the group who gained success first and then provide motivation to other group members to move forward, (3) Strong village institutions and good village capacity will have a major impact on the progress of village development. Villages that have large natural resource potential without accompanying a good management model will certainly not have a major impact on the progress and welfare of their communities. To increase the participation of local communities in the management of natural resources, the role of village institutions is very important. Village institutional and village capacity building can be done through training and seminar activities, which can be a capital for village natural resource management

## 1. Introduction

Peat is formed from the accumulation of crop residues, both decayed and not. The accumulation is thicker because the decomposition process is hampered by conditions of lack of oxygen and/or other environmental conditions that cause pressure on the decomposers. Therefore, peatlands are often found

in backswamp areas or poorly drained basin areas. The formation of peat soil is a geogenic process, namely the formation of soil caused by the process of deposition and transportation, in contrast to the process of forming mineral soil which is generally a pedogenic process.

Several studies estimate the formation of peat in the world between 10,000-5,000 years ago (during the Holocene period) and peat in Indonesia between 6,800-4,200 years ago (Andriessse, 1994). Peatlands in Indonesia are found in lowlands and highlands. In general, peat swamp land in the lowlands is found in tidal swamp areas and ramps, located between two major rivers in the physiography / backland of the backswamp, swalle, closed basin, and coastal plain. Peat swamp land in the highlands is generally found in closed basins such as those found in Rawa Pening (Central Java), Padang Sidempuan (North Sumatra), and Danau Sentarum, Kapuas Hulu (West Kalimantan). Most peat swamp land is in the lowlands and only a small portion is found in the highlands.

Landform formations that are relatively the same or similar to the formation process and dynamics are called physiographic units. The characteristics of peat ecosystems are referred to as "peat hydrological unity" (KHG), peat ecosystem located between 2 rivers, between rivers and seas, and / or at swamps or puddles. Meanwhile, what is meant by "peat ecosystem" is the order of the peat element which is a comprehensive whole unit in peat hydrological unity that influences each other in shaping their balance, stability and productivity. Whereas what is meant by "characteristics of peat ecosystem" is the nature of peat which consists of physical, chemical, biological, and sediment types below it, which determines the carrying capacity of the peat ecosystem area as a growing medium, environmental service provider, biodiversity owner, and hydrotopography.

Indonesian peat characteristics generally have large peat domes and woody peat covering extensive swamp and forested peatlands and in low landscape areas. Located mainly among large rivers. The largest peat locations are in Sumatra, including Siak Regency.

Indonesia's tropical peat is an important ecosystem among other ecosystems (high carbon carbon ecosystem) thanks to its vital role as a reservoir of carbon and water and its carrying capacity to river and beach ecosystems.

## **2. Literature Riview**

To see a policy, it depends on the implementation of policy itself. Implementation concerns an action of how far a direction has been programmed that really satisfy. Finally, at the highest abstraction level of implementation as a result of some measurable changes in the big problems that become a program targets.

Mileti and Gottschlich (2001) stated that disaster loss is a result of interaction of natural physical process, social characteristic of population, and environmental condition built. The characteristic differences of these three systems result in different loss in different natural disaster. It is deeper, the research reveals about society mitigation strategy in dealing with land and forest fire disaster.

Peatlands are defined as areas where there is an over 30 cm thick layer of peat on the surface. They are wetlands where partially decomposed organic material forms peat in the absence of oxygen. Peatlands are hydrological entities within rain catchment basins and therefore drainage or extraction in one part can alter the whole peatland area (Anna Salomaa ; 2018) .

Sona Suhartana (2018) Timber harvesting at peatland should proceed with great care and cautious action, as the peat characteristics are fragile and brittle. Peat is irreversible ecosystem, thus once the peat is damaged, it will be difficult to return to its normal situation. The timber harvesting at peatland area that conducted in arbitrary ways may bring about substantial and severe damage to the vegetation and peatland themselves. For facilitating and enabling the timber harvesting activities in peatland areas, forest companies commonly build a canal for transportation. Besides for transportation, the canals are also beneficial for water management, thereby enabling the vegetation to grow well. The canal

development in peatland areas may cause the lowering of soil-water surface as well as induces faster decomposition at the layers over the soil-water surface.

The paradigm in the concept of disaster management is more developing, from a technocratic approach to a disaster risk management approach. This approach is the result of interrelationship of three components namely, hazard assessment, vulnerability analysis, and enhancement of management capacity. An approach change in the disaster management process is also done by switching the top-down system to bottom-up. The society plays an important role in reducing a disaster risk reduction in its region (Yodmani, 2001).

The forest fire is relatively large is caused by the abundance of commonly flammable objects. The type is distinguished from (1) ground fire (2) surface fire (3) crown fire and Cause of Forest and Land Fires in Indonesia are: Natural Factors and Human Factors.

### **3. Research Methodology**

This research's type is qualitative with explorative method. The research activity applied two data sources that were primary data obtained directly from the field, and secondary data obtained through study of documents from various sources that was relevant in this activity. Primary data was obtained through Focus Group Discussion (FGD) in research areas, observation to perception and behavior, and interview by using questionnaires. The secondary data of this study were research reports, journals, annual reports, evaluation reports, regulatory and legislative documents, meeting note, and other relevant documents.

### **4. Result and Discussion**

Based on the latest survey and calculation from Wahyunto et.al. (2005), it is estimated that the area of peatland in Indonesia is 20.6 million hectares. This area means about 50% of the total area of tropical peat land or about 10.8% of the land area of Indonesia. If seen from its distribution, peatlands are mostly found in Sumatra (around 35%), Kalimantan (around 30%), Papua (around 30%) and Sulawesi (around 3%) million hectares or around 14.9% of the land area of Sumatra Island, with a major spread along the east coast lowlands, especially in Riau Province, South Sumatra, Jambi, North Sumatra and Lampung.

From this area, land classified as peat soil, where the thickness is > 50 cm, is an area of 6,876,372 ha. Most of them (3,461 million - 48,1%) are in the form of peatland with moderate depth (depths between 101-200 cm). Very deep peat (depth > 400 cm) occupies the second largest area of 2.225 million ha. (30.9%). Although the total area of peatland on Sumatra Island did not change in 2002, when viewed from the composition of the depth has changed, which is classified as peat soil (> 0.5 meters) has decreased to 6,521,388 ha or decreased by 354,981 ha (9.5%) compared to 1990. In addition, deep-peat also reduced to 1,705 million ha (23.7%), while the peat (50-100 cm thick) expanded from 0.3777 million ha (5.2%) in the year 1990 to 1,241 million ha (17.2%) in 2002.

In Indonesia, The Peatland Restoration Agency is a non-structural institution under and responsible to the President. The goal is to realize the accelerated recovery of the area and return of hydrological functions of peat moss due to forest and land fires. The activity is conducted in specific, systematic, directed, integrated and comprehensive. It is also to coordinate and facilitate peat moss restoration in Riau Province, Jambi, South Sumatera, West Kalimantan, Central Kalimantan, South Kalimantan, and Papua. The Peatland Restoration Agency has to prepare a plan and implementation of five years peat moss ecosystem restoration with approximately 2,000,000 (two million hectares).

This peatland restoration activity is certainly involve many parties to be fully realized, together with the Local Peatland Restoration Team (LPRT) for hair restoration program in Riau Province, there is activity plan as follow:

#### **1. Rewetting Program**

The rewetting activity is a continuous discussion process. The rewetting activities consist of



Construction of artesian wells, Canal development, Water management development (at a company), and Water management team building and training.

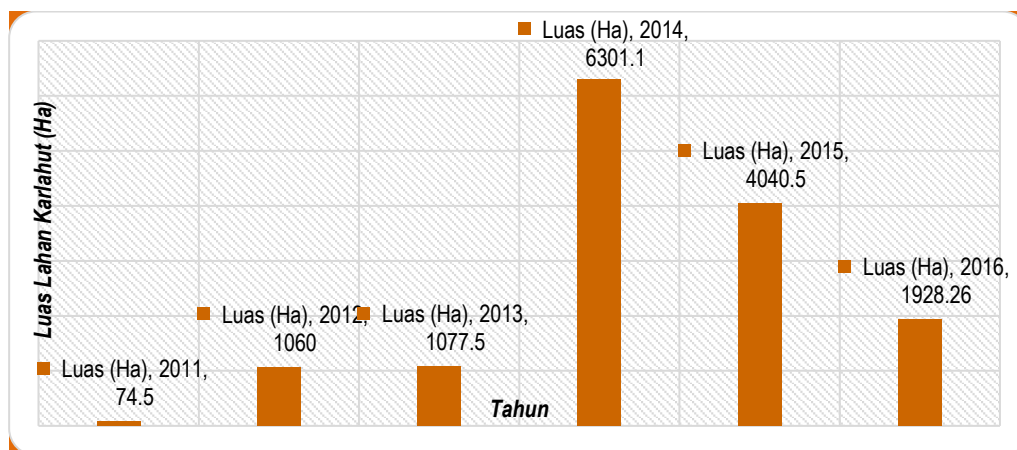
2. Revegetation Program

The revegetation program is a green activity area especially on burnt-out land. Revegetation program is designed by BRG, among others: Making of peatland village seedlings, Cultivating of seedlings from peatland villages, Making of horticultural crops, and Cultivating of horticultural crops.

3. Social Economic Revitalization Program covers: development of land fishery business, livestock development business, honey bee development business, ecotourism development of peatland, cultivation of natural plant, utilization and processing of sago pulp, mangrove crab cultivation, sustainable development of food house, development of peat moss care village. In the case of peatland restoration program, many stakeholders are involved from variety of interests to succeed peatland restoration program.

Riau Province is one of the provinces that have the largest peat land in Indonesia. Peat land area Prov. Riau reaches + 3.859.522 ha. Most of the peatlands have been utilized for various purposes such as plantations, HTI, housing and others. The water management that is not good yet so that the land becomes dry and the potential for greater karlahut is bigger worsens this.

Riau Province is one of the biggest disasters of fire forest and land province in Indonesia. The largest karlahut peak in Prov. Riau occurred in 2014, which reached 6,301.10 Ha (Sipongi-Karlahut Monitoring System, 2016). The point and area of Karlahut area in Riau Province spreaded in some regencies/cities. Among other are Siak and Pelalawan regency. Despite there is a decrease of burned land in 2016 (to an extent of 1,928.26 ha), but this case indicates that Karutut is still an environmental problem that has not been resolved completely up to now.



Data Source: Sipongi-fire land and forest monitoring, 2016

In general, the cause of land and forest fires in Riau Province can be grouped into two, namely land and forest fires is caused by natural factors and land and forest fires caused by human factors. Land and forest fires in Riau Province, especially in Siak and Pelalawan regency that continue to take place each year, the cause is mostly by human factors, either it is accidentally or intentionally.

Peatlands are one type of wetland ecosystem with potential biological resources that have the potential to be developed as life support systems (Gailbraith H, et. Al., 2005). Peatlands provide several ecological, economic and social services. Where environmental services provided are factors that must be considered in protecting the ecosystem (Egoh, B.et. Al., 2007).

The conversion of forest land to oil palm plantations on peat swamp ecosystems is the dominant factor that causes peatland degradation. Noor, M., 2007., stated that improper land management with land

clearing activities that do not pay attention to the biophysical characteristics of the environment, cause peatlands to degrade and become abandoned land. This condition causes loss of genetic resource diversity, socio-cultural disintegration and marginalization of farmers and environmental damage (Reijntjes C, et.al. 1992).

Hydrological system restoration to maintain the natural process of peatland and its capacity to store carbon and other environmental services, the activities required for this component are i) physical restoration, on the hydrology of peatlands through the blocking of ditches and ditches, and ii) improvement of economic welfare of the community , accompanying these physical activities.

If the hydrological disturbance is not immediately addressed, it is feared that the level of degradation of forest and peatland areas in the region is expected to continue and worsen. These conditions will result in peatland ecosystems that will face massive environmental degradation problems in the future, including the dangers of forest and peat land fires, as well as floods, which in turn will affect the economic activities of the community, health problems and the threat of biodiversity in the forest remaining peat swamps.

The use of peatlands for plantation business in Siak Regency is expected to be able to maintain the sustainability of ecological, economic and social functions in these ecosystems. Agroecology of oil palm plantations is a very complex and dynamic system. System dynamics are formed from various interactions between vegetation, nutrient cycles, hydrology, social and economic population (Meiling L, KJ Goh. 2008).

Oil palm plantations on peatlands have brought about significant changes and caused loss of ecological, economic and social functions on these peatlands. Opening and land clearing activities and channel construction (canalization) cause changes in the water system (hydrology). This condition affects the changes in land fertility levels, subsidence and irreversible drying, peatland fires and land conflicts.

The development of oil palm plantations on peatlands is carried out with the principle of agricultural development based on the optimization and sustainability (sustainability) of land resources, without neglecting aspects of productivity, economic and social values. According to Cooke IR et.al (2009) and Walter C, H Stutzel., 2009 states that a multidisciplinary approach using agroecological indicators that integrate ecological, social and economic aspects can be done to evaluate the sustainability of plantation activities.

## **5. Conclusion**

1. Peat land restoration program is an activity to restore degraded peat soil back to its original function. The effort of peat land restoration program is still a realization from the rewetting program, which is the construction of canal blocking. Meanwhile the revegetation program, the Peat Land Restoration Agency collaborate with social institution by assisting the society has done the planting of sago seedlings like natural wood. For the revegetation program, it has not been realized due to the massive implementation for peatland restoration program.

2. Community empowerment through the activities of granting grants / revolving assistance needs to pay attention to, among others are: (1). Type of economic commodity. The selection of the right type of economic commodity will greatly affect the success of economic activities. (2). Guidance and assistance. (3). Examples of success. Support from the local government is generally given to groups that have shown tangible success, so the role of the facilitator to communicate with the local government is very necessary; (4). Motivators in groups have motivators among group members. In groups that are considered successful, there is always one group member who gets success first and then gives motivation to the other group members to move forward.

3. Strong village institutions and good village capacity will have a major impact on the progress of the village development. Villages that have large natural resource potential without being accompanied by a good management model will certainly not have a major impact on the progress and

welfare of their people. To enhance the participation of local communities in the management of natural resources, the role of village institutions is very important. Strengthening village institutions and the capacity of village officials can be carried out through training and seminars, which can become capital for village natural resource management.

4. Community empowerment in the management of peatlands (beaches and transitions) is determined by land and water management arrangements; use of ameliorant / fertilization; land fires and productivity of oil palm plants. The success of sustainable agriculture development on peatlands is by regulating land and water management in accordance with the characteristics of water in the area. Water management arrangements (drainage depth) will affect the rate of subsidence on peatlands.

5. Economic empowerment of the people in the sustainability of the management of coastal peat and transitional peat (brackish peat) shows that the level of management of oil palm plantations is still low in Siak Regency. Oil palm plantation activities have an impact on the degradation of the quality of peatlands.

## 6. Recommendation

1. The restoration of peat lands continues to be implemented in accordance with its achievement targets for all priority areas throughout Indonesia and not just a pilot project and only the interests of some people. As an implementer that has a quite important role, the Peat Moss Restoration Agency should be more have coordination particularly to local government, since the local government has the territory but also has an authority.
2. There needs to be a Village Institutional System Study that aims to identify the types of institutions that exist and explore their problems and needs, as a reference for community empowerment through village institutional development. The assessment was carried out through direct interviews and group discussions with the Village community leaders and tools. Interviews are conducted to collect various information that is needed, then collected and grouped so that it becomes more effective and focused.
3. In an effort to increase the institutional capacity of village government, the intervention of local government and social institutions becomes very important, namely: Provision of Facilities / Media for Information in Villages, Informal Meetings and involving Village Devices in Meetings and Training. Coordinating various new information and building understanding of development and problems in the village are carried out through various informal meetings to build emotional relationships and mutual openness, so that village issues and personal aspirations of village devices will be easily explored and mediated.
4. The existence of technology that can be applied in the community to maintain ecology in a sustainable manner through the arrangement of land and water management in accordance with the characteristics of water in the area, because the arrangement of water systems (depth of drainage) will affect the rate of subsidence on peatlands

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# The Influence of Knowledge and Attitude on The Performance of Nagari Apparatus in Nagari Financial Management in Sungai Tarab, Tanah Datar

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**Abstract.** The purpose of this study was to analyze the influence of knowledge and attitude on apparatus performance in nagari financial management in Sungai Tarab Subdistrict, Tanah Datar, West Sumatra. This study used quantitative approach. Population of this study consisted of 70 nagari apparatus in Sungai Tarab Subdistrict. The sample in this study was determined through multi stage random sampling technique with Slovin formula and consisted of 68 apparatus. Data were collected through questionnaires with Likert scale measurements and analyzed with multiple regression analysis technique. The results of this study indicated that there was a significant influence of the knowledge on nagari apparatus performance in financial management in Sungai Tarab Subdistrict, Tanah Datar amounted to 5,4%. Besides, there was also a significant influence of the attitude on nagari apparatus performance in financial management amounted to 4,0%. Finally, there were also simultaneously significant influence of knowledge and attitude on the nagari apparatus performance in financial management amounted to 5,6%. Based on this study, it could be concluded that the knowledge and attitude were needed for nagari apparatus in nagari financial management, although the influence were not so strong.

## 1. Introduction

According to the Government Regulation of the Republic of Indonesia Number 58 at 2005 concerning that Regional Financial Management in general terms stated that regional finance is all regional rights and obligations in the context of the administration of local government that can be assessed with money include all forms of regional wealth. Regional financial policy is always directed at achieving development goals, creating an independent regional economy as a joint effort on the principle of kinship based on economic democracy based on Pancasila and the 1945 Constitution with an increase in the prosperity of the people equally.

According to the Minister of Home Affairs Regulation Number 13 at 2006 concerning Guidelines for Regional Financial Management in the first Article at Paragraph 8<sup>th</sup>, Regional Financial Management is the whole activity which includes planning, implementing, administering, reporting, accountability, and regional financial supervision.

Based on the principle of organizing regional government, the State of Indonesia adheres to the principle of decentralization. The principle of decentralization is the principle that states the submission of a number of government affairs from the central government or from higher levels of government to lower level regional governments so that it becomes the household affairs of the area.

Furthermore, in the Head of Tanah Datar District Regulation Number 11 at 2014 Concerning the second Article Financial Management Guidelines for Nagari, Nagari finance is managed based on transparent, accountable, participatory principles and is carried out in an orderly and budgetary manner. Nagari financial management is managed within one fiscal year, starting from January 1<sup>st</sup> to December 31<sup>st</sup>. Although, the reality on the ground is that problems are still found in nagari financial management in Tanah Datar Regency.

As happened in Tanah Datar Regency, the realization of the Village Fund Allocation (ADD) the first phase in the three villages of Tanah Datar District is still not implemented. This resulted in 72 other villages being constrained by phase II ADD disbursement sourced from the State Budget (APBN). Based on the study and analysis of the Minister of Finance Regulation No. 50 / PMK 07 of 2017, from 14 Districts in Tanah Datar District, only four Sub-districts have fulfilled the PMK, the remaining 10 Districts have not reached the realization target. The four villages that have fulfilled are Batipuh consolidated sub-district 90.28 percent with 54.38 percent achievement, consolidated South Batipuh 81.76 percent with 56.79 percent realization, consolidated Padang Ganting 78.85 percent, with 84.73 percent realization and Buo Buo consolidated at 71.35 percent with the achievement of 54.75 percent. While ten sub-districts that have not achieved the realization target are, X Koto, Pariangan, Rambat, five Tribes, Tanjung Emas, Lintau Buo Utara, Sungayang, Sungai Tarab, Salimpaung and Tanjung Baru (RedaksiSumbar.com, 2017). Based on this problem, it can be seen that there are still several sub-districts in Tanah Datar that have not yet achieved the realization target, one of which is Sungai Tarab Sub-district.

Furthermore, other problems that occur in the Tarab River District are indications of corruption from infrastructure development funds due to lack of knowledge, as reported by SumbarToday, 2016 Again, allegations of corruption were found in the field by the investigation and monitoring team of the INDONESIA PRISON NON GOVERNANCE ORGANIZATION in Tanah Datar Regency. This started from the construction of an infrastructure project in the form of a road in Nagari Sungai Tarab which was suspected of having detected a corruption. Met at his office, Wali Nagari Sungai Tarab, Tanah Datar Regency, regretted this. "Actually, this is because of the ignorance of our members. Maybe there is no coordination between the Nagari and the Department of Public Works. If this is wrong, we should take part of it and we thank you for being reminded of this." H.Emrizal, SE told sumbartoday.com, Tuesday (11/22). When the Secretary of Nagari Sungai Tarab was confirmed through this media, with his arrogance, he replied that what he did was correct and in accordance with the rules. But in the end Suprihadi acknowledged his negligence in working on this road project. "We are wrong, for the future we will try to improve it," said Suprihadi. If this is the development of infrastructure in the nagari, then the destruction will surely come because of the administrator of the nagari without being provided with clear knowledge and legal protection so that the entire implementation of development in the nagari will be in vain. Whatever the reason, indications of fraud have already appeared in the construction of this road project. Work is ready, but until now there is no project signpost. We even asked for a RAB, answered by the Secretary of Nagari, a secret item. It can't be shown to just anyone.

Furthermore, based on previous research, the authors found that there were results of research examined by Wulan, 2004 with the title Influence of Knowledge, Skills and Attitudes towards Employee Performance at the Office of Water Resources Management in Central Java Province. The results of his research indicate that there is a significant influence between variables of knowledge, skills, and attitudes toward performance. Besides that based on the results of research conducted by Chers, et al, 2016 with the title Effect of Knowledge Management, Work Skills and Attitudes on Employee Performance (Case study at PT. National Nobu Manado Area Bank) with research results that knowledge management partially does not have a significant influence on employee performance, while ability and attitude partially have a significant effect on employee performance.

Based on the description above, the writer has carried out in Sungai Tarab Subdistrict, Tanah Datar District about the Influence of Knowledge and Attitude towards Administrators of nagari Performance in Financial Management of Nagari in Sungai Tarab District, Tanah Datar. The formulation of the problem in this study is

- 1.1 whether there is an influence of knowledge and attitudes towards the performance of the administrators of nagari in nagari financial management in Sungai Tarab District?
- 1.2 Are there any knowledge influences on the performance of the administrators of nagari in nagari financial management in Sungai Tarab District?
- 1.3 Is there an influence on the performance of the administrators of nagari in nagari financial management in Sungai Tarab sub-district?

## 2. Overview of Literature

## 2.1 Knowledge

Knowledge is information that a person has for a particular field. Scores or knowledge tests often fail to predict HR performance because the score is not successful in measuring what knowledge and expertise should be done at work. The knowledge test measures the ability of test takers to choose the most correct answer, but cannot see whether someone can do work based on their knowledge (Budi W. Soetjipto, etc., 2002).

According to Blanchard & Thacker (2004), knowledge is categorized as follows: (1) Information obtained and placed in our memory (*declarative*). (2) How information is collected and used to something we already know (*procedural*). (3) Understand *how*, *when* and *why* information is useful and can be used (*strategic*). Knowledge reflects the cognitive abilities of an employee in the form of the ability to recognize, understand, realize and live a task or job. Therefore, an employee's knowledge can be developed through education, both formal and non-formal and experience. Education equips a person with the basics of knowledge, theory, logic, general knowledge, analytical skills and character development and personality (Robins and Judge, 2009). Whereas according to Bloom and Skinner, knowledge is the ability of a person to re-express what he knows in the form of verbal or written answer, the evidence or writing is a reaction from a stimuli in the form of oral or written questions (Notoatmojo, 2003).

So knowledge can be inferred as the subject's view of the stimuli in the senses, then adopted by subjects who will influence them in behaving and taking one's decisions.

Based on this view, then the employee's knowledge about the task or job can be measured by indicators such as the following:

- a. An understanding of the scope of the task or job
- b. understanding of the procedures for implementing the tasks for
- c. understanding of the way the implementation tasks for
- d. appreciation of the responsibilities of the task or job
- e. understanding of the challenges in the implementation of tasks or work
- f. Suitability of variation of knowledge possessed, with knowledge in the execution of tasks.

According to Spencer and Spencer, quoted by Sutoto (2004), knowledge clusters include competence *analytical thinking* (AT), *conceptual thinking* (CT), and *technical / professional / managerial expertise* (EXP)

- a) *Analytical thinking* (AT) is the ability to understand the situation by detailing it into small parts, or see the implications of a situation in detail. In essence, this competence allows one to think analytically or systematically about something complex.
- b) *Conceptual thinking* (CT) is understanding a situation or problem by placing each part into a single unit to get a bigger picture. Including the ability to identify patterns or relationships between situations that are not clearly related; identify fundamental issues or keys in complex situations. CT is creative, conceptual, or inductive.
- c) *Expertise* (EXP) includes related knowledge on work (can be technical, professional, or managerial), and also motivation to expand, utilize, and distribute that knowledge.

## 2.2 Attitude

According to Robbins (2007), attitude is an evaluative statement both pleasant and unpleasant towards objects, individuals, or events. This reflects how someone feels about something. According Thurstone (Alo Liliweri, 2005: 195) said that attitude is a positive or negative reinforcement of objects that are psychological.

Meanwhile, experts in providing definitions of attitudes have many differences. This happens because of a different point of view about the attitude itself. Attitudes at the first interpreted as a condition for

the emergence of an action. The concept then develops more widely and is used to describe the existence of a specific or general intention, relating to the control of responses to certain circumstances Young (Zaim Elmubarak, 2009: 45). So, it can be concluded that attitude is an object that gives positive and negative power to the subject such as individuals or events that influence the response of certain circumstances.

### 2.3 Performance

Performances comes from *performance*. Some give an understanding of *performance* as a result of work or work achievement. But actually performance has a broader meaning, not only the results of work, but includes how the work process takes place Wibowo (2012).

According to Wake (2012: 231) explains the performance (*performance*) is the result of work achieved in someone in the work based on job requirements (*job requirements*). Understanding performance is also stated by Widodo in Harbani (2010: 197) saying that performance is doing an activity and perfecting it in accordance with its responsibilities with the results as expected.

Furthermore according to Anwar (2011: 67) the term performance comes from the word *Job Performance* or *Actual Performance* (work performance or actual achievement achieved by someone). Saying that performance is the work quality and quantity achieved by a person in carrying out its functions in accordance with the responsibilities given to him. According to Robbins in Syamsir (2010) defines that performance is the result achieved by a person according to the size that applies to the work that is concerned. Sinambela et al. in Harbani (2010: 198) defines performance as an employee's ability to do something with a particular skill.

Based on the description above it can be concluded that performance is the result achieved both in quality and quantity based on the responsibility given to him.

Factors that influence performance according to Timpe in Syamsir (2013: 75) find only two dimensions that affect individual performance, namely: a) internal dimensions, (individual nature, ability, and type of work) and b) external dimensions (social environment like behaviors, attitudes, and actions of co-workers, subordinates or leaders, working facilities and organizational climate.

Syamsir (2013: 75) states that there are several dimensions that affect performance, namely

- a. individual dimensions consisting of ability, motivation, and educational background
- b. Psychological consists of attitude and personality
- c. Organizations that consist of leadership, reward, and division of roles

Borner (2002) states that there are three variables that can affect performance, namely:

- a. People variables include attributes that a person has before carrying out tasks such as knowledge, organizational knowledge, ability, self-confidence, cognitive style, intrinsic motivation, and cultural values.
- b. Task variables include factors that vary both inside and outside the task, such as complexity, presentation format, processing and standby mode response.
- c. Environmental variables include all conditions, conditions and influences around people who perform certain tasks, such as time pressure, accountability, predetermined goals and feedback.

### 2.4 Financial Management of Village

Financial management of rural / village is not only about the necessity of supporting regulations and infrastructure, but the most important is the recruitment of competent and reliable commitment. With the enactment of Law Number 6 of 2014 concerning Villages, the village government participates in managing finances and is accountable for it. In Law No. 6 of 2014 concerning Villages 1<sup>st</sup> article 10<sup>th</sup> Paragraph what is meant by Village Finance is the right and village obligations that can be valued with money and everything in the form of money and goods related to the implementation of village rights and obligations.

In general, in Indonesia the regulations governing the Village Financial Management Guidelines are the Minister of Home Affairs Regulation No. 113 of 2014 concerning Guidelines for Village Financial



Management. In the Minister of Home Affairs Regulation No. 113 of 2014 concerning Guidelines for Village Financial Management 1<sup>st</sup> Article 6<sup>th</sup> Paragraph states that Village Financial Management is the whole activity which includes planning, implementing, administering, reporting and village financial accountability.

According to Rohmansjah (2015: 3) village finances are defined as all village rights and obligations that can be assessed with money and everything in the form of money or in the form of goods that can be used as village property in connection with the implementation of these rights and obligations. Village finance is basically a subsystem of state finance as stipulated in Law Number 17 of 2003 concerning State Finance. Meanwhile, according to Muhammad (2007: 32) village financial management is the whole activity which includes planning, budgeting, administration, reporting, accountability, and village financial supervision.

Based on Government Regulation Number 47 of 2015 concerning the Implementation Regulation of Law Number 6 of 2014 concerning Villages 1<sup>st</sup> article 8<sup>th</sup> paragraph, what is meant by village funds are funds sourced from the state budget of revenues and expenditures intended for villages transferred through regional income and expenditure budgets district / city and is used to finance government administration, implementation, development, community development, and community empowerment.

So it can be concluded that village financial management is an activity that includes planning, budgeting, reporting, accountability of village heads and village officials in managing village finances.

According to Yusuf, there are several indicators to measure the performance of village heads in village financial management, to be able to use or be seen from the following:

- 1) Transparent, meaning that people can know and get access to information as broad as possible about village financial management or Regional expenditure budget village through the principle of openness.
- 2) Accountable, meaning the principle of a person's obligation to account for the management and control of resources and the implementation and policies entrusted to him in the framework of the ignition of the intended purpose.
- 3) Participatory, meaning that the community is given the widest possible opportunity to be actively involved in every stage of village financial management.
- 4) Orderly and budgetary discipline, means that Regional expenditure budget village must be managed in a timely and effective manner supported by administrative evidence that can be accounted for and guided by applicable regulations.

### **3. Research Methods**

Method in this study uses quantitative research. The approach used in research, processes, hypotheses, field down, data analysis and data conclusions until the writing uses measurement aspects, calculations, formulas, and certainty of numerical data. The population in this study is the existing administrators of nagari in the nagari in Sungai Tarab District, Tanah Datar. The sample in this study consisted of 68 respondents who were determined using the Slovin formula and the sample determination technique was carried out using technique *Multi Stage Random Sampling*.

Data collection in this study uses a questionnaire with Likert scale measurement and uses 4 answer options (*strongly agree, agree, disagree, and absolutely disagree*). The data analysis technique used is multiple linear regression which begins with the classical assumption test as required in the regression test. In addition, to get a general description of the two variables, the frequency, mean, and TCR (Level of Achievement of Respondents) are also used.

## **4. Research Results and Discussion of**

### *4.1 Research Findings*

As stated in the introductory section, this study wants to answer three research questions or problem formulations. The formulation of the first problem is: are there any influence of knowledge and attitude

together on the performance of the administrators of nagari in nagari financial management in Sungai Tarab District, Tanah Datar? To answer this research question can be seen the results of analysis of research findings data as presented in Table 1 below.

**Table 1. The Effect of Knowledge and Attitude Simultaneously on Administrators of nagari Performance in Financial Management of Nagari**

Models Summary <sup>b</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.319 <sup>a</sup>	.102	.056	.31986	1.260

a. Predictors: (Constant), Average Attitude Competence, Average Knowledge Competence

b. Dependent Variable: Average Financial Management of Nagari

Based on the 1<sup>st</sup> Table above it can be explained that the value of *Adjusted R Square* obtained from regression analysis is 0.056. That is, the magnitude of the influence of knowledge, and the attitude together on the performance of the nagari in nagari financial management is 5.6%. While the rest is influenced by other factors.

Furthermore, the formulation of the second and third problems, which will be answered in this study are: are there any independent influences on aspects of knowledge and attitudes towards the performance of the administrators of nagari in nagari financial management in Sungai Tarab District, Tanah Datar? In summary, the results of regression testing to answer the formulation of the problem can be seen in Table 2 below.

**Table 2. Self-influence Knowledge of Administrators of nagari Performance in Financial Management of Nagari**

Models Summary <sup>b</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.278 <sup>a</sup>	.077	.054	.32008	1,225

a. Predictors: (Constant), Average Knowledge Competence

b. Dependent Variable: Average Financial Management of Nagari

Based on the 2<sup>nd</sup> Table above it can be understood that, the value of *Adjusted R Square of knowledge* is 0.054. This means that the influence of knowledge on nagari financial management is 5.4%. While the rest is influenced by other variables.

**Table 3. Influence of individual attitudes towards Administrators of nagari Performance in Financial Management of Nagari**

Models Summary <sup>b</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson

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1	.252 <sup>a</sup>	.064	.040	.32248	1101
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a. Predictors: (Constant), Average Attitude Competence

b. Dependent Variable: Average Financial Management of Nagari

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Based on 3<sup>rd</sup> Table above it can be understood that, the value of *Adjusted R Square* Attitude is 0.40. This means that the influence of knowledge on nagari financial management is 4%. While the remaining 96% is influenced by other variables.

#### 4.2 Discussion

The Results The study that influence that knowledge and attitudes on performance in nagari financial management in Sungai Tarab Subdistrict, Tanah Datar has proved that there is an influence of skills and attitudes towards the performance of the nagari devices in nagari financial management which is 5.6%. The knowledge of the nagari financial management was 5.4% independently, while the influence of attitudes towards the performance of nagari devices in nagari financial management was 4%.

Based on the results of this study can be understood that this study can strengthen the theory proposed by Timpe in Syamsir (2013: 75) states that there are two dimensions that affect individual performance, namely: a) internal dimensions, (individual nature, ability, and type of work) and b) external dimensions (social environment such as behavior, attitudes, and actions of coworkers, subordinates or leaders, work facilities and organizational climate.

Furthermore, this research also strengthens the theory put forward by Syamsir (2013: 75) stating that there are several dimensions' effect on performance, namely

- a. the individual dimensions consisting of ability, motivation, and educational background
- b. Psychological consisting of *attitude and personality*
- c. Organizational consisting of leadership, *reward*, and role sharing

Then the theory put forward by Borner (2002) states that there are three variables which can affect performance, namely:

- a. People variables include attribute that a person while doing the task such as knowledge, organizational knowledge, ability, self-confidence, cognitive style, intrinsic motivation, and cultural values.
- b. Task variables include factors that vary both inside and outside the task, such as complexity, presentation format, processing and standby mode response.
- c. Environmental variables include all conditions, conditions and influences around people who perform certain tasks, such as time pressure, accountability, predetermined goals and feedback.

#### 5. Conclusion

Based on the results of the research and discussion above it can be concluded that:

1. Knowledge and attitude variables together have a significant influence on the performance of the nagari devices in nagari financial management in Sungai Tarab District, Tanah Datar Regency, which is 5.6%.
2. Knowledge variables on the performance of the device villages in the financial management of villages in Sungai Tarab Tanah Datar has value *Adjust R Square* of 0.054 so that it can be said that the contribution of knowledge to the financial management of villages there are 5.4%.
3. Variable attitude towards villages device performance in financial management in the villages Sungai Tarab Sub district Tanah Datar District has an *Adjust R Square value* of 0.40% so that it can be said that the contribution of attitudes towards nagari financial management is 4%.

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# The Hallyu in Pekanbaru: An Ethnographic Study on Indonesian Kpopers Parasociality

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**Abstract.** This paper explores the impact of the phenomenal Korean Wave or hallyu among the youths of Pekanbaru, in the Riau Archipelago, Indonesia. The significance of Korean popular culture, better known as K-pop, is perhaps primarily marked by the rising popularity of K-pop communities in key urban cities across Indonesia. In the context of Pekanbaru, however, there are apparently only 3 remaining active K-pop fandom communities left today out of 15 that attempted to advance the globalized phenomenon of hallyu. Critically informed both by du Gay's Circuit of Culture and Horton's Parasociality as the study's overlapping parameters, we focus our ethnographic inquiry on the impact of hallyu on the members of K-popers Pekanbaru. The scope of our inquiry on the identity construction of the K-popers Pekanbaru community is defined by the 'youthful' consumption, production and regulation of hallyu's parasociality. Data were collected through a set of ethnographic techniques such as observation-participation, focus group discussions and in-depth interviews the founder and members of K-popers Pekanbaru as well as authorities on local and popular culture. The wider implication of hallyu on the maintenance of local and ethnic cultures in Pekanbaru will also be discussed in the paper.

## 1. Introduction

### 1.1. Background

Hallyu is a popular Korean culture spreading to global in many countries including Asian countries. The term hallyu can have an impact on people learning Korean language and culture (Khairana 2014). This phenomenon refers to the direction of Korea's globalization of culture that has grown to this day [1]. The success of Korea's popular culture is not spared from the role of the mass media. Mass media such as television, magazines, newspapers and the internet influence this popular Korean wave. Furthermore, online media currently presents many sites related to Korean artist, K-pop, and his country life [2]. Korean wave is generally understood in terms of percentage increase in cultural products such as television drama, fashion, film, music, and dance [3].

The popularity of the Korean wave in Indonesia can be seen from various Korean cultural exhibition activities from 2009 to 2011, the Korean-Indonesia Week [4]. Park Chung Hee said that the spread of South Korean culture itself has begun since the end of the 1980 South Korean democracy process which also had an impact on external openness, such as the inclusion of Hollywood films to Korea in late 1980 after the ban on foreign films since 1960 [5]. In the same year, it was also the introduction of Korean culture that broadcasts various entertainment such as Korean drama, film and music series [6]. Korean Pop (commonly known as K-pop) is a popular type of music originating from South Korea [7].

Korean pop music is a stream of music created in South Korea presented by various audio visual elements. It comprises popular dance, electronic ballad, hip-hop, pop rock, modern blues and R & B, etc. Although the type of Korean music is not originally from South Korea, but due to the adaptation of western music, then it looks like modern music [8]. Abroad, many Korean artists have been popular and

have many fans. K-pop songs have been included in the American charts Billboard which has been a world-class music industry's measure of quality. Interest in K-pop music is an indispensable part of Korean wave in various countries [2]. The development of K-pop music is currently illustrated by idol groups (boyband and girlband). The high popularity they receive has impacted the spread of the boyband and the girlband as a brand image or product face. The K-pop phenomenon continues until 2012 where the music industry is beginning to become a business for high achievement in various countries.

The high interest of Indonesian teenagers on K-pop through a 'boyband / girlband' singer makes K-pop a cultural content of Korea's Cultural Wave that can maintain cultural festivals in various countries including Indonesia [9] Currently K-pop is so popular with young people because of the beautiful and handsome Korean actresses and attractive fashion. In addition, K-pop music is also easy to listen (easy listening) and in keeping with the tastes of the community so easily accepted by the young [10] According to South Korean President, Youtube has an important role in spreading K-pop music streams worldwide [1] The concept of parental interaction has been steady in media and literature communication since the term first appeared in the article by Wohl and Horton..

Pekanbaru is one of the big cities in Indonesia. Pekanbaru town has a social group called Korean Lovers. Among the Korean fan community is Kpopers Pekanbaru, Shadow, blossom, BlackPink, Black wings, B-friend, and STALKER. Of the seven community of Korean fans, one of the active communities to date has held various activities and has a considerable number of members of the Kpopers Pekanbaru community. The Kpopers community of Pekanbaru has a group of 253 people. The Kpopers Community of Pekanbaru was established on February 10, 2014. The purpose of this establishment is that the entire Kpopers of Pekanbaru will be united and assemble together to create harmony between fellow fans. Each member of the group consists of students and people who have worked. Usually these communities often gather to share information about popular Korean culture. In addition, they also make joint activities or activities in order to spread Korean culture more widely among the community. Next, what makes it interesting from this community is they have a dance cover group called FBK entertainment, BlindFold and AOD. These three dance cover groups always copy songs and dances from Korean boyband and girlband. To date, the community also adapts a hedonic tendency to life, imitating the style of dress, hair color, accessories, property, recruiting new group members, making various competitions in their community birthday celebrations and their idol's anniversary. Additionally, like Korean artists, they even feel like an artist who also has time to appear in front of the crowd and follow various competitions. The Kpopers community of Pekanbaru also has rules (regulations) that must be complied with by every member of the community. Not only that, they also changed their names with Korean names. Their way of speaking is also unique, which is to use a variety of Korean vocabulary when communicating with fellow group members.

They are also interested in learning Korean. Apart from Korean, everything from the ginseng country attracts them. Examples of the use of electronic devices, fashion use, facial makeup, eating special Korean food, singing music and watching Korean serial drama. The Korean celebrations held by the Kpopers community became one of the group's efforts to further develop Korea's popular culture. To identify Korean style in their community they also use various social media. It's very clear how they strive to show their Korean identity through the new media, the day-to-day appearance and Korean cultural products they use. It is interesting to study because in essence, the community has arisen because of the spread of Korean entertainment products through massively packaged media that has caused fans to form a loyal social community of anything connected with Korea. The researcher chose Kpopers Pekanbaru as the subject of study because based on the observations conducted by researchers, from seven Korean fan communities in Pekanbaru, the only Kpopers Pekanbaru community is still active in performing various activities until now. According to data obtained by researchers from Kuansing terkini.com, many people from Pekanbaru who do not like either neglected the presence of this community. They think that this group is just a group of young people wasting time and wasting money. The young generation of Pekanbaru is expected to be able to learn and develop the local culture, but change direction. They are a group of young people who are joined by social communities such as the Pekanbaru Kpopers community. It is undeniable that they are more interested in foreign cultures

coming to Pekanbaru than local indigenous cultural values.

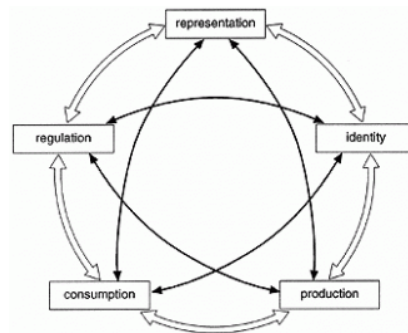
### 1.2. Purpose

This study looks at the process of establishing the identity of members of the Kpopers Pekanbaru group. Directly he wants to prove that popular culture is a phenomenon that can provide positive awareness and does not necessarily give adverse effects to these popular cultural enthusiasts.

### 1.3. Theory

#### 1.3.1. Theory of Culture Circuit

Du gay (1997) says that some academics have recognized the need for more complex and more satisfying approaches to studying cultural production and consumption [11] Johnson et al. (1986) states that this model considers the production (production) and consumption (consumption) relationship that can be used in different ways for different objects, spaces and images. [12] refers to consumer goods such as food items that are subject to repeated repurchases and services. The product may move through a different circuit or system of allocation, pattern and speed according to many variables along the route design.



Source: Paul Du Gay 1977

#### a. Representation

Hall said that representation is one of the aspects that play a role in shaping culture. In a book written by Paul Du Gay, it says that representation is a part of the circuit of culture that plays an important role in shaping culture. Representation relates to regulation, consumption, reproduction, and identity [11]. Representation is a major study in cultural studies. The representation itself is interpreted as how the world was constructed socially and presented to us and by us in certain significance [13].

Representation also relates to the symbolic production of making signs in the codes where we create meaning. By studying our representations we learn the creation, construction of meaning. Representation is also related to the representation: not the original idea or the original physical object, but a representation or version of it built. [14] explains that in Stuart Hall's book there are two systems that are concept maps and language systems. For the first one is how to organize, at the concept stage, knowledge of our experience in this world (material, abstract, movement, power, etc.) and establish complex relationships between the others.

#### b. Consumption

Often defined as the end of the production process, where an object is consumed after it is produced. In articulation theory, production and consumption (as well as other elements) are seen as dialogical relations, where one and the other define each other. [11] states that production at the same time is consumption and vice versa. Without production, there will be no object to be consumed and without consumption, there will be no subjects for the product [15].

*c. Production*

In addressing one of the main key theoretical goals in the study of cultural production. The Culture circuit theory give suggests the meaning is generated on several different websites and distributed through different practices ad the process. [16] The production and representation process is closely linked to the consumption process. A production does not mean that there is no accompanying consumption and the representation represents to show what is consumed[17].

*d. Regulation*

[18] States that the concept of this regulation refers to the mechanism of production and consumption (the use of cultural products). The regulatory process in two interrelated forms [19] First, official government policies and regulations relating to the popular Korean cultural industry. Second, the rules must be proved by all the members of the group. Both forms of regulation are dynamic and competing [20]. The regulation governs and provides rules for each member to become more disciplined [21].

*e. Identity*

Identity by Storey [22] is how an individual or group defines themselves. The concept of identity is one of the most important, as it is only through establishing our own identity and learning about identity. Individuals and other groups combine to find out what makes the same with some and different people. The relationships between to each other and closely above the components. Stuart Hall named the relationship between the components of the circuit of culture as 'articulation', which is the process of relationships between various moments of very different in a circle of elements [17].

The concept of a cultural circuit is very useful in helping to understand connecting different nodes in a cultural circuit. By allowing different elements in the circuit such as production and repressing, and representation with consumption. [11]. Identities are created through rules, thus generating different identities. Therefore, we can see that the meaning is embedded at the time of production and can not be regarded as the single result of the process. Identity through other levels of the circuit, consumption, regulation, and identity [17].

## **2. Methodology**

Research methodology is an important aspect of research to explain how the research works. Methodology is a framework on the methodology or procedure of a predetermined study. In relation to the qualitative research that the researcher did, the ethnographic approach was very relevant to this study. Ethnography examines the social and cultural forms of society is constructed and elaborated through the analyzes and causes of the researcher. This study uses a chain of snowball sampling techniques performed on the chain by asking information on the person who was previously contacted or who has been interviewed before. In this study, the researcher sought help from the community leader of Kpopers to ask the prospective informants. Subsequently, at the first step the number of subjects used in the study amounted to three groups of dance cover and one community leader. In this study, the researcher also interviewed a cultural expert who could answer all the questions given by the researcher. The subjects are determined by the researcher based on the characteristics of the subjects either for deep interview informers or the focus group discussions. For focus group informants, they consist of Pekanbaru community who are participating in the K-popers community of Pekanbaru for at least 6 months, involving men and women aged 16-26, knowing about Korean culture, wanting to provide information to researchers, and want to follow all the rules set of studies. In-depth interview informants are comprised of Penganbaru K-popers community, Pekanbaru's K-popers chief and a cultural man who is a cultural expert with extensive experience and involved in cultural management in Pekanbaru.

In this study, the researcher chooses focus group discussions to find a meaning in the understanding of a group. Additionally, this focus group discussion to facilitate researchers in avoiding the wrong meaning of the researcher. The determination of the subject in this study was the fanatics of Korean



cultural enthusiasts who were members of the Kpopers Pekanbaru community consisting of three groups of dance cover groups. Each group is 5 people. These three dance cover groups are categorized as focus group discussions. In-depth interview techniques are conducted to obtain more information and information by viewing interview question guides, voice recorders, recorders cameras, face-to-face interviews with informants. While for the subject of an in-depth interview, researcher chose the founder of Kpopers Pekanbaru, community leader, and Riau cultural mastermind. Observation techniques are intentional and systematically supported with the recording of observed symptoms. The purpose of the observation in this research is to obtain the whole image of the subject. Through this observation the researcher can view and record all informant activities through behavior, physical appearance, expression, speech, emotion, and other nonverbal aspects. In the observation process, the researcher participated in the various activities held by each group member. Documentation techniques are done by searching information from newspapers, magazines, tabloids, photographs, and collections of CD and DVD drama Korean drama series.

### 3. Result And Discussion



Source: Kpopers Community Pekanbaru

#### 3.1. Representation

Korean representation focuses on the acceptance of Korean culture. The interest in Korean culture can be attained by just hearing a word about Korea. Indirectly, by simply listening to Korean words they have already processed and given meaning to the meaning of the Korean word.

*"The Korean people are handsome and beautiful, drama, songs, good beauty products, war between Korea and South Korea ..."*

### 3.2. Consumption

The interest of group members joining the K-popers Community of Pekanbaru to this Korean culture should have a slight influence on their identity. The formation of a new identity as a result of the interest in Korean culture will certainly have an impact on their daily lives and activities. This will not only change one's perspective, but it will affect how to communicate, how to dress, how to enjoy food, and more. In this regard, from the outcome of the focus group discussion gathered from members of the K-popers community of Pekanbaru, it can be seen that the aspects of Korean influence led to the formation of a new identity.

#### 3.2.1. Using Korean fashion

By styling Korean fashion, they indirectly show their identity to the public. For K-popers women, they try to follow Korean fashion especially in terms of dress and make up. In terms of coloring the hair, they will usually color the hair only on school holidays and during the dance cover only. The purpose of coloring their hair is one of the totality forms in the appearance of their group dance as with the boyband and girlband they are interested in during the show. During the day, not all K-popers want to color the hair even though there is a desire. Their intentions have to be set aside especially for the K-popers because they are still in secondary school. Rules at school do not allow them to color their hair, when they are not followed, they will be punished by the school. Although Korean stars often use exposed clothing, this must be adjusted by group members in the Korean fan community with what is prohibited by Islam and what is governed by Islam. The process of refining is also done to avoid negative views by parents as well as the environment for Korean fan community members, not to mention being a Malay categorized as a nation that still holds true to Islamic culture.

*' For the Korean fashion problem, because our Muslim clothes and our hair styles are more polite. Polite look people but similar to our idol. It's just like that, not everything.*

#### 3.2.2. Watch the concert

Although the distance of Pekanbaru City with Jakarta is far enough, the informant is not an obstacle but he has twice seen Super Junior's performance in Jakarta. He once went to Jakarta to see the very popular reality show in Korea, which is Running Man recorded in Jakarta.

*'... if it's from myself already. Alhamdulillah I have twice seen a concert. Jakarta and that concert tour Suju. So the items that I brought to the concert were laxting, the Project banner, the same accessories that I think I should take.*

#### 3.2.3. Collecting Korean Goods and Accessories

Some members of the community group Kpopers Pekanbaru who are also very fond of Koreans, some who just love to collect posters of their idols. The idols they consider to be interesting, will try to find the poster. The collection of posters, shirts, bracelets, rings and accessories used by the Kpop stars became one of the things that gave them a sense of joy.

*'.. I would rather collect posters, dresses, rings, bracelets, and accessories used by my idol.*

#### 3.2.4. Korean language

Fandom who is part of the Kpopers community in Pekanbaru has indirectly made Korean as their identity. Many of the Kpopers who study Korean language are self-contained or have a Korean language course in Pekanbaru City. The use of Korean language seems to be seen as they are gathering and interacting with fellow experts in the Kpopers group. When they meet older ones, use eonny's greeting for women and oppa for men, especially when they meet to say anyeonghaseo or halo and the word Gumawo or kamahamahamida in Malay language means thank you. The purpose of using Korean when interacting with fellow Kpopers is to more closely and learn to recite Korean language so long time will become fluent when used. From Korean, they have acquired new knowledge that has never been had been studied at school.

*".. I am learning Korean language autodidically. From internet, books, dramas, films, and Korean*

*songs. For everyday use of Korean language I am accustomed to other community colleagues"*

### 3.2.5. Korean Food

Every culture of course has different specialties. This difference in food will have a great appeal to the lovers and fans of a culture. Members of the group who are Korean fans and lovers have stated that they have tried various Korean specialties. Eating a special Korean meal is a matter of time when the members gather in one place where food sells a variety of Korean specialties. Some of the Korean specialties they try are among others such as tetoboki, jajangmyeon, kimbab, kimchi, samyang and so on. Some also say that this food can be eaten through her friends can to cook Korean specialties. *'... We've eaten tetoboki, Jajangmyeon, ramyeon kimbab, kimbab, Samyang, Kimchi, and try Korean food cooked by our friends\''*

### 3.2.6. Watch Korean Drama

One of the things most loved by fans and fans of the Kpopers Pekanbaru community is watching Korean serial drama. The storyline that is thought to have a romantic and everyday life is one of the pre-emptive factors in this community group of Kpopers Pekanbaru. The Korean drama series each title has a different storyline. Each storyline also has the most favored part of every member in the community group. Many of Kpopers's women prefer the Korean drama series of men. To watch the drama alone, they can spend a full day in the room, especially when it's a school holiday. Not only that, the purpose of watching Korean drama series is as entertainment and also to get rid of tiredness caused by school and work activities. The need to watch Korean serial drama seems to have been a mandatory activity for Kpopers members. Looks at the results of the interviews conducted by the focus group discussion.

*'When a holiday can be spent more than 12 hours in the room. We work and school from morning till late, so by watching Korea dramas can get rid of our tiredness, but the Korean drama story is very unique, romantic, and hard to guess'.*

### 3.2.7. Follow social media idols

To get information about Korea, these Kpopers usually use social media from their fan base or social idol accounts. From the accounts of this fan base, members of the Kpopers Community of Pekanbaru can easily share videos about Korean actors.

*We have more updates instagram, youtube, twitter, video-clip, and facebook''.*

### 3.3. Production

The publication of activities organized by the K-popers community of Pekanbaru in the print media as well as on the local media on the community that the group has done has some appreciation until it is uploaded in local newspapers. With the ever-expanding activities of the print media as well as the online media, it will have an impact on this increasingly recognizable group. This will also attract other people to join this community and will attract outside viewers to invite this community group to fill various events to perform.

*"so that we want to be recognized by the public, we broadcast all our activities through online media such as social media and also publish our performance through print and online newspapers. The purpose is to attract potential community members and we are popular among the people*

### 3.4. Regulation

Apart from parents' consent, individuals who want to join the community must also follow other rules that are responsible and also have high self-esteem for the community. Each member of the group must also contribute to the community for 10,000 Rupiahs per month. Group members will also be fined or charged when members in the community do not comply with the prescribed financial affairs. This rule can be seen from the discussion with Princess as a member of Kpopers Pekanbaru.

*'...who are required to join this community are men and women of at least 11 years of age, permitted*

*by parents, have the intention and confidence, responsibility and good etitude. They need to spend money on buying costumes and others and having time to practice. Other rules are cash cash Rp 10,000 per month, if the first 30 minutes delay without the information being fined Rp. The next 10,000 and 30 minutes will be fined Rp 5,000. If it does not come, it should be permitted at least 1 hour before the scheduled training schedule, and the exercise will end until 6 pm*

### 3.5. Identity

Identity creation is an application rather than consumption and other component aspects. The use of Korean fashion, Korean to communicate, eat Korean food, watch Korean films and the use of websites for information related to idols is indispensable to community members.

*"What we've been using in our daily lives such as using Korean fashion, watching Korean films and dramas, using Korean language with friends, eating Korean food, updating idol information is already a mandatory activity for us. People easily recognize us , because our appearance is different from ordinary people .. No day without information about our idol, we love them so much" "*

## 4. Conclusion And Advice

In order to analyze the theory of cultural circuits, researchers have discussed various issues and are being adopted by Korean culture enthusiasts who are members of the Kpopers Pekanbaru community. In the theory posed by Du Gay iia states that there are five important elements in the process of identity formation, namely: regulation, production, consumption, representation and identity.

### 4.1.1 Representation

Representation is the most important part of the process in which the meaning is produced and exchanged between members of a group in a culture [22]. Representatives link between the concepts in our minds using a language that allows us to define real objects, people or events and the world of imagination of objects, people, objects and events that are not real or fictional. The process of representation that occurs among members of the community group Kpopers Pekanbaru is when representing the word Korean. In the findings of the study, each member who was given a question of what was first thought when pronounced the Korean word had repressed among others the beautiful and lively Korean people, the romantic Korean drama, the war between North and South Korea, and there were Korean boyband and gorlband very interesting.

### 4.1.2. Consumption

Consumption is a site where power, ideology, gender, and distribution of social classes and form one another. Uses involve the study of certain moments, negotiations, representational formats, and rituals in commodity social life. The use of cultural objects by consumers may authorize, demean, disenfranchise, liberate, essentialise, and stereotype. Consumers are caught in the hegemony market [16] Various things that are closely related to Korea will certainly be one of the targets by members of the Kpopers community of Pekanbaru, which include: consuming Korean food, learning Korean, collecting and using Korean accessories, watching Korean dramas and films, and also following pages idol.

### 4.1.3. Production

The production (expenditure) more specifically, Du Gay (1977) explains production (production) is a cultural production not only refers to the production of traditional products related to the cultural industry, such as literature, music and film, but also to any goods which is deliberately written with certain meanings and associations as it is produced and distributed [14] A person's love for a culture can not only be realized in the form of practicing and taking what the culture offers. The love of a culture can also be used to make money. In the production element, members of Korean merchandise group, participate in various races, and broadcast activities in social media, online newspapers and prints.

#### *4.1.4. Regulation*

Regulations are usually used in plural forms, they may refer to the rules or restrictions imposed by the authorities, as in government regulations [14] Each community has the necessary rules to disobey. The rules are to give instructions to the members of the existing group. With the prevailing rules, members in community groups are aware of what to do and what they can not do. Regulations are very important for the sustainability of the activities to be done by the Kpopers community of Pekanbaru, among others: the candidate for the group must get approval from parents, pay Rp. 10,000 per month, paying fine when late to the training, each member is obliged to follow the various activities held by the community.

#### *4.1.5. Identity*

Identity by Storey [23] is how an individual or group defines themselves. The concept of identity is one of the most important, as it is only through establishing our own identity and learning about identity. Individuals and other groups combine to find out what makes the same with some and different people. Of the four elements such as production, regulation, consumption, and representation eventually create a new identity among members who are members of the Kpopers Pekanbaru community group. The birth of a new identity in members who are members of the Kpopers Pekanbaru community are changing their daily lives. Another impact is the development of new culture and gradually eliminate local culture. The findings of the study were obtained when group members in their daily lives met with fellow Korean fans using Korea to communicate, use Korean fashion, follow various sites of idol, and eat Korean food.

### **4.2. Parasocial Impact**

The implications presented through the establishment of the parental identity and consumption of members of the K-popers community of Pekanbaru are important for further debate. The popularity of Korean culture in the world as a whole and in Pekanbaru has particularly brought significant changes. The emerging and emerging Korean culture is one of the new things and brings new habits in society. The Korean culture that has its own present concept and also the attractive style of being one of Korea's cultural factors is accepted by the local people, especially Pekanbaru youth, with ease. Hallyu's Korean wave phenomenon has had many effects on a society. The culture brought by Korean stars makes Korea culture as one of the most sought after and acceptable cultures in society. The concept of change brought by Korean stars can be seen on the use of various beauty tools, dress styles, talk of anyone in communicating as well as the use of attractive language and this is one of Korean star supporters to increase its popularity. This is evident in the presence of various groups in the Korean fan community. Almost all interesting things from Korean culture are often used as references to practice in everyday life.

### **4.3. Korean culture in terms of culture**

In an in-depth interview with a Riau cultural expert there is information that Korean culture is very easy to enter and accept by the community. There are many reasons why this Korean culture is acceptable to the community. Among the reasons he has shown is the high spirit shown by Korean culture as well as Korean culture that is considered to be in line with today's life. He says that the spirit of popular culture is simpler, simpler and more suited to today's life. Popular culture is mass culture, more freer and more preferred by people, simpler, updated, and when we enjoy popular culture, we assume we are in the world today.

### **5. Conclusion**

The wave of Korean wave "Hallyu" has given a variety of effects to a country. The culture brought by these Korean stars makes Korean culture one of the most sought after and acceptable cultures of all societies. The concept of change brought by the korean stars to the use of various beauty tools, dress styles, tutors in communicating and also the use of attractive language is one of the support of this Korean star to enhance its existence. This is evident in the presence of various groups in the Korean fan community. Any interesting thing about Korean culture is often used as a reference for everyday life.

Members of the Kpopers community in Pekanbaru tend to perform various activities related to Korean

culture they are interested in, from enjoying frequent Korean drama drama, Korean songs and music, eating specialties from Korea, as Korean stars, using beauty tools like Korea and many other things. All these provide new identity creation within members in the community.

Furthermore, the interest of members of Korean culture is also included in the use of various Korean specialties and also following various Korean-related matters. This characterizes them as one of the Korean fans. In other words, just by looking at the appearance style of this Korean gentleman, it would be well known that he was the one who liked and practiced Korean culture.

## 6. Advice

The next researcher is expected to make a Korean-themed study in a larger city because of its fanatics bigger than Pekanbaru. The themed Korean we can do with other research methodologies, not just focus on only one methodology.

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## **Evaluation of Network Station System Implementation (SSJ) in Indonesia**

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**Abstract.** Although it has been mandated in the Broadcasting Law Number 32 of 2002, the implementation of the Network Station System (NSS) has experienced obstacles coming from national broadcasting industry players. Weak supervision has also been a great contribution to the lame implementation of NSS since it was ratified. The purpose of this study was to determine the development as well as implementation of the Network Station System (NSS) in Indonesia and to identify the obstacles might happened. This study uses a qualitative approach with descriptive methods. The informant of this research are the Commissioner of the Indonesian Broadcasting Commission (KPI) and REMOTIVI, a NGO that advocate regulation on television media broadcasting. Data Collection Techniques: Interview, Observation, and Documentation. In addition to the weak regulation, economic interests are the main factor from national private television broadcasters not carried out the NSS according to the law. This situation ultimately cannot create diversity of ownership and diversity of content as expected. To encourage the implementation of SSJ, there must be a great political will and strict regulation applied from related parties in broadcasting industry. Collective supervision from NGO and society also play vital role.

## **Communications Pattern In Virtual Community To Support Parents Who Have Asd (Autism Spectrum Disorder) Children**

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**Abstract.** The complex problems of children with autism make parents need a communication channel to seek information about autism. Patients with autism require special handling and treatment to minimize the symptoms that often accompany patients such as tantrums, mood swings or mood swings quickly also stimming. Based on the research, parents of ASD (Autism Spectrum Disorder) children have higher levels of stress compared to parents of other disabilities. They need a place to share and ask questions about many things about autism. The presence of a virtual community brings quite positive implications for parents of children with autism. Through virtual communities, especially in social media, they can communicate with each other and get information about handling children with autism and gaining online social support. One virtual community that is considered worthy of research is the LRD Member SuarAutisme community on Facebook, where the number of members above 7 thousand numbers and has a high traffic among its members in exchanging information about the handling of autism.

Based on the above description, this study aims to 1) identify patterns of communication and exchange of information regarding the treatment of autism among parents who have children with ASD that occurs in virtual communities and 2) Describe the most needed information for parents who have children with ASD in virtual communities

The research approach used is qualitative, with the method of virtual ethnography. Source of data obtained from the informant with snow ball sampling technique, the parents who have children with ASD and actively interact in the virtual community LRD Member SuarAutisme on Facebook. Data collection procedure will be done through participant observation in virtual community and in-depth interview to informant. The data will be analyzed qualitatively which is then interpreted and presented in the form of a description or narrative to conduct theoretical interpretation and give meaning to the result of the research.



## **Handling Climate Change Adaptation And Mitigation: Government Public Relations Strategies Towards SDGs**

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**Abstract.** As an archipelago, Indonesia is very vulnerable by the impact of climate change. Indonesia's ability on mitigation and adapting to climate change is not as advanced as developed countries yet. Climate change is a global issue whether as a main principal or connected with Sustainable Development Goals, involving complex system; social interactions, economy, environment and institutional system.

Indonesia's Ministry of Environment and Forestry has been managing climate change mitigation and adaptation. Despite its significance of institutional change, from Climate Change National Council to the Ministry Office, it is still tough to deliver Climate Change mitigation and adaptation through government-public relations strategy to support one of Sustainable Development Goals .

This paper aims to answer major research questions; (1) To what extent do key climate change mitigation and adaptation are disseminated by Government Public Relations, (2) to find out how government's public relations strategies executing mitigation and climate change adaption for sustainable development goals. Using qualitative approach with case study method, data interpreting and collecting step uses qualitative approach through in depth interview with Directorate General of Climate Change Control and Government Public Relations Office of the Ministry of Environment and Forestry, and President's representatives to World Climate Change Forums.

# **The Implementation of Government Regulation (PP) Number 81/2012 on The Management of Household Rubbish by The Office of Environmental Services in The Padang City**

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**Abstract.** The purpose of this study was to describe the implementation of Government Regulation (PP) number 81/2012 on the management of household and similar household rubbish by the Environmental Office of the Padang City. This study was a descriptive research using qualitative approach. The informants in this study were the staffs of environmental services office of Padang City, environment experts and WALHI staffs of West Sumatera. Informants in his study were determined through purposive technique. The data were collected through interview, observation, and documentation study. The finding of this study indicated that the implementation of PP number 81/2012 on the management of household rubbish by Environmental Office of the Padang City had not provided significant change for household waste management in Padang City. The obstacles faced in this management included low public awareness in household waste management. However, these obstacles could be controlled through technical guidance, socialization, training, and the establishment of a waste bank for the community.

## **1. Introduction**

The city of Padang is one of the largest cities in West Sumatra and the capital city of the province of West Sumatra. Padang City has forty percent of the effective urban area, which is inhabited by various groups of people (<https://padangkota.bps.go.id/>). This resulted in the city of Padang as the city with the most potential to produce the most waste production compared to other districts / cities in West Sumatra Province.

Garbage is an important issue in urban environmental problems. The city government of Padang as the government administrator has a significant role in solving this problem. The waste management system in Padang City is fully managed by the Padang City SKPD namely, the City of Sanitation and Landscape Services. But the Sanitation and Landscaping Service (DKP) is now the Padang City Environmental Service (DLH).

Despite the existence of a waste management institution, it does not necessarily solve the problem of solid waste in the city of Padang. In fact, in the management of household waste that is not managed properly in the city of Padang, it can be seen from the volume of household waste continues to increase in line with the increase in the community, changes in quality of life and dynamics of community activities. Unmanaged waste is the cause of health problems because it is a hotbed of disease, disgusting and causes unpleasant odors, flooding, pollution of soil, water and reduced value of cleanliness and beauty of the environment.

PP No. 81 of 2012, household waste is waste derived from daily activities in the household that does not include feces and specific waste, paragraph (2) This waste management arrangement aims to: preserve the function environment and public health; and make waste as a resource. Likewise, there is a lack of public awareness in disposing of garbage in the city of Padang, where people often make the river flow as a landfill, even though along the river basin there are already announcements prohibited from throwing garbage in the river.

After observing the Padang City Environmental Office, several socializations, appeals and activities related to household waste management were carried out, with the aim of making the community independent, making the city of Padang clean and green, and an additional outcome for the community. But it has not given such a big change for the management of household waste. In this study researchers looked at how the implementation of Government Regulation No. 81 of 2012 concerning Household Waste Management and Household-like Waste by the City of Padang DLH, what are the obstacles faced in carrying out the implementation of PP No. 81 of 2012, and the efforts that have been made by the government in overcoming the obstacles faced in the Implementation of PP No. 81 of 2012.

Public policy is an action taken or taken by the government to take action that can change the state of the public from the bad to good, and the good becomes better. Public policy according to Mulyadi (2015: 3) is a process of formulation, implementation and evaluation of policies that are continuous and interrelated, carried out by the government with stakeholders in regulating, and resolving various.

Public affairs, public problems and available resources for public benefit. According to Thomas R. Dye in Wahab (2015: 14) public policy is the choice of any action taken or not by the government. Meanwhile, according to William N. Dunn (2007: 78) public policy is a series of interconnected choices made by government institutions or officials in fields related to the tasks of government, such as defense, energy, health, education, welfare people, crime, urban, and others.

Afriva Khaidir (2017: 18) public policy is a product of various political activities. This starts from the placing of a public problem or problem in the policy agenda, the occurrence of debate or deliberation about the solutions to be taken, the legislative body adopts alternatives based on practical considerations or even affiliation or political ideology adopted.

According to Afriva Khaidir (2017: 31) public policy is a series of actions that are carried out or not carried out by a government that has a purpose or is oriented towards a specific goal for the benefit of the entire community. From various definitions of public policies that have been described by several experts, it can be concluded that public policy is a choice made by the government that can be through a program or action to achieve certain results and objectives.

Implementation according to Purwanto (2015: 22) is one stage in the process of public policy. Usually implementation is carried out after a policy is formulated with a clear purpose. According to Smith and Lamirer (Wahab, 2012: 141) Policy implementation can be conceptualized as a process, a series of government decisions (a serial of decisions) and actions (actions) that aim.

Implement government decisions or State legislation decisions that have been made or formulated previously. Meanwhile, according to Adil Mubarak (2012: 3) Implementation is also conceptualized as outcomes, which are focused on the consequences of the implementation of the program / policy, meaning whether the implementation really has an impact on the various public / community problems or even the opposite adds new problems in people's lives.

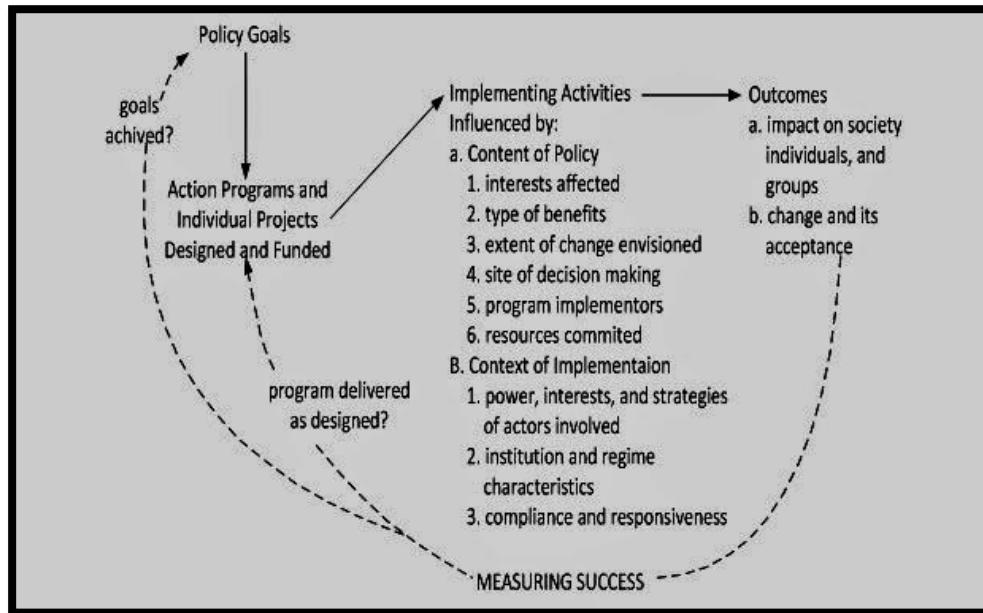
Policy implementation (Wahab, 2002: 59) is a part that cannot be separated from public policy. Policy implementation enters into the policy process, starting from the preparation of the agenda, problem formulation, forecasting, policy recommendations, policy implementation, and policy evaluation or assessment. Policy implementation in principle (Nugroho: 2011) is a way for a policy to achieve its objectives, no more and less.

In Mulyadi (2015: 66-84) Models of Public Policy Implementation there are 9 (nine) Models namely a) Merilee S. Grindle model, b) George C. Edward III model, c) Mazmanian and Sabatier models, d) Donald models S. Van Meter and Carl E. Van Horn, e) the Hogwood and Gunn models, f) the Goggin, Bowman, and Lester models, g) the Elmore model, h) the Nakamura and Smallwood models, i) the Network model. To facilitate and direct this research, the researcher chose the Merilee S. Grindle model because it was more suitable with the research of researchers.

Policy implementation theory proposed by Grindle (Agustino, 2008: 154) he states that the success of

a policy is measured by the process of achieving the outcome (outcomes) of the policy, which is achieved or not the goals to be achieved. When viewed from the dimensions of the policy environment, there are three indicators are: a) Power, Interests, and Strategies of Actor Involved (Power, interests, and strategies of actors involved), b) Institution and Regime Characteristics (Characteristics of institutions and authorities), c) Compliance and Responsiveness (Compliance and responsiveness).

**Gambar 2.1 Implementation as a Political and Administrative Process**



Grindle (1980; 11)

Grindle (1980) proposes two major variables that determine the success of an activity implementation. This variable is the content of policy and the implementation environment (context of implementation). The policy content variable consists of:

1. Interest Affected
2. Type of Benefits
3. Extent of Change Envisioned
4. Site of Decision Making
5. Implementors Program
6. Committed Resources

According to Subarsono (2005) When viewed from the dimensions of the policy environment, there are three indicators described in this theory, the indicators are: a) Power, Interests, and Strategies of Actor Involved (Power, interests and strategies of the actors involved), b) Institution and Regime Characteristics (Characteristics of institutions and authorities), c) Compliance and Responsiveness (Compliance and responsiveness).

This theory emphasizes the contents of the policy in the implementation process. Grindle also explained comprehensively almost all aspects to analyze the problems that arise, ranging from the contents of the policy, external factors that will affect the implementation process, to see the impact that will result from the implementation of a policy. When compared with other approaches such as Ripley & Franklin's model, this model only focuses on non-bureaucratic factors. The bureaucratic factor that should also be a determinant of the implementation of a policy is not too much highlighted in this approach. One example is the absence of indicators that discuss capabilities in terms of implementor resources. Likewise with the other models proposed by Van Meter and Van Horn which in theory emphasize more on the relationship between two or more institutions that coordinate with each other, besides that the external environment is also sufficiently considered in this theory. But it has not been able to see the impact on this problem later. Therefore, the researcher determined to use the implementation model proposed by Grindle.

## **2. Research Methods**

This study uses a qualitative approach with a type of descriptive method to find out how the implementation of PP No. 81 of 2012 concerning the management of household waste and garbage Similar to Household Waste by Padang City Administration. This research also translates or translates with own language about the results of research obtained from informants in the field as an interview to get an explanation of the existing conditions. Researchers use several techniques for collecting data including observation, interviews, and documentation.

Interviews have been carried out with several research informants including the DLH of Padang City for PSDK (Waste and Hygiene Management), environmental experts and WALHI (West Sumatra Environment Forum). The form of interviews was conducted openly with research informants. Data collection tools in interviews are interview guidelines. Interview guide in the form of questions and explanations to respondents. Observational data in the form of factual, careful and detailed data about the state of the field, human activities and social situation and the context in which the activity took place. In this study documentation carried out in the City of Padang DLH with camera media, documentation records, and recordings of interviews. The documentation that has been obtained in the form of recordings of interviews, photos and documentation notes in the City of Padang DLH in the field.

## **3. Research Result**

After conducting field research, this chapter will describe the findings of researchers about the Implementation of PP No. 81 of 2012 concerning Management of Household Waste and Waste Similar to Household Waste by the City of Padang DLH, which was seen from the implementation of Government Regulation No. 81 of 2012 by the City of Padang DLH. In addition, it will also be identified about the constraints in the Implementation of Government Regulation No. 81 of 2012 concerning Household. The success of a policy implementation is measured from the process of achieving the final results, namely:

### *a. Interests Affected by Policy*

In implementing Number 81 of 2012 in the Management of Household Waste in the City of Padang, researchers found parties whose interests were influenced by this policy were the City of Padang DLH (as the main actors and SKPD who had the greatest responsibility in this policy), Padang City Satpol PP, Padang City Market Service, Padang City Public Works Agency, Padang City BPMPKB, Padang City Health Office and Padang City Community. The appropriateness of the community and related services is fulfilled, it can be proved by a clean environment that is sufficient. Where there is no visible garbage piling up.

But there are still public and city government interests that have not been fulfilled because in the regulation there is a process of management, sorting, recycling and utilization of household waste, as evidenced by the waste that is not disaggregated by households as well as management, and others.

### *b. Benefit Type*

The benefits expected by the implementing regulations, namely the existence of this government regulation is expected from the activities carried out in the field related to socialization, technical guidance and all kinds of household waste management, namely how to minimize the generation of waste produced by the household itself, so there is not much waste to be disposed of to the landfill, from the upstream or from the household itself the waste has been reduced. That is the goal and benefit of Government Regulation No. 81 of 2012 concerning the management of household waste. Another type of benefit from Government Regulation No. 81 of 2012 is that the benefits are very many people taught to be independent, and can empower the community in the villages and also do not need to monitor our garbage collector just to hang the garbage in front of the house.

### *c. The desired degree of change*

The existence of government regulations is expected to bring changes if implemented, the changes in

question are in the management of household waste that is in accordance with what is expected by the implementing regulations. In implementing this regulation, it is expected that the changes that occur to the community are able to raise public awareness of the waste management. By conducting activities that can be added value to the community, such as managing household waste that can be reused. For the present condition it has started to be good, moreover it has been subsidized by vehicles. So managing waste is even faster, he transports garbage from homes, but only 30% is new.

*d. Decision Making Location*

The parties directly involved in the implementation of the PP are the Padang City DLH as the main executor, and partners who assist some of the programs in efforts to achieve policy objectives. The partners are Padang City Satpol PP, Padang City Market Service, Padang City Public Works Office, Padang City BPMPKB, Padang City Health Office and Padang City Community.

*e. Program Implementer*

Implementation of regulations has the ability in their fields to support implementation. In the implementation of government regulations, the parties who will be directly involved in the management of household waste are the City of Padang DLH in the field of Waste and Hygiene Management (PSDK) as the main executor, and partners who assist some of the programs.

*f. in efforts to achieve policy objectives.*

The implementation of the program from this regulation is still minimal, as seen from programs planned in the city of Padang such as the establishment of a waste bank in the city of Padang, there are 15 garbage banks, but only 2 waste banks are running.

*g. Resources deployed*

The implementation of a policy must also be supported by supporting resources so that its implementation works well. These resources can be in the form of financial resources, human resources, as well as machinery and infrastructure. The resources in implementing this government regulation are DLH employees, especially in the field of PSDK, then the facilities and infrastructure of the Environmental Service.

But in this case the facilities and infrastructure owned by DLH are still minimal in transporting garbage, of the total motorized pedicabs in 2014 there were 16 fleets but in 2016 there were only 5 motorized tricycles, as well as pick up cars in 2014 there were 13 fleets but in 2016 only there are only 5 fleets.

*h. Power, Interest and Strategy of the Actors Involved*

Implementation of government regulations on household waste management conducted by the DLH of Padang city, in addition to binding regulations there are also other interests in it. Like promotional media to inform the public that the government regulation is indeed there for household waste management. The strategy carried out by the Environmental Office of the city of Padang is that in the past 2 years there has been a training on household-based waste management, so the material is given in the socialization, how the community is sorting out garbage. And another strategy is to run existing activities in the community, the agency buys works from the community produced from household waste, it is our appreciation to the community, and also sponsor.

*i. Characteristics of Institutions and Rulers*

The environment in which a policy is implemented also affects success, so in this section the researcher wants to explain the characteristics of an institution that will also influence a policy. The ruler of PP No. 81 of 2012 is the DLH of Padang city, but in this case DLH rarely conducts surveys and is less assertive towards violators who violate PP No. 81 of 2012.

*j. Compliance and Community Response*

The implementation of a program will run well and smoothly if the interest group and target group perform their functions correctly. Interest groups that perform tasks according to procedures will not experience significant obstacles. And when the target group obtains and implements advice from the

group, it will automatically create the expected program success.

That compliance and responsiveness from the community towards household waste management is still low. To overcome this, a kind of cooperation is needed with several partners. Like Community Counseling Institutions (LPM). To transport waste from community houses. The low compliance and responsiveness of the community is due to the fact that the implementing regulations themselves are less active in fostering the community. In this case, the relevant department overcomes problems or constraints by conducting socialization, holding activities, and technical guidance.

#### 4. Conclusion

- a. The management of household waste in the city of Padang has been implemented but not yet fully. The degree of change that has occurred in Padang City has already been sorted garbage, but the change is only limited to that, when the garbage is already there is a sorting bin consisting of five tanks.
- b. Constraints encountered in the Implementation of PP No. 81 of 2012 in Household Waste Management in the City of Padang, namely public awareness is still low to date. Training was conducted on the level of public awareness and there was still a lack of attention to waste.
- c. Efforts made by the Padang City Environmental Service, namely: Conduct socialization, training, counseling, technical guidance. Especially in the field of waste management and hygiene itself, it conducts training on household waste management in communities.
- d. Suggestion
- e. To the Padang City Environmental Service, it is necessary to conduct further socialization, but socialization must be accompanied by education. Good education at an early stage how to manage waste making compost from waste. It is also necessary to review waste management in RT or RW, which is rarely done.
- f. It is hoped that the community will increase awareness and responsiveness to household waste and also improve discipline in disposing of garbage, by following activities and socialization held by related agencies.

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# The Meaning of Political Messages of Regional Head Candidate (Voters' Perceptions in the Election of Governor and Vice Governor of Riau in 2018)

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**Abstract.** Direct Regional Election (Pilkada) is a process of recruitment of leaders in the area that places the community as the subject of the assessor and the candidate of the Regional Head (candidate) as the object that is assessed and chosen. Objects assessed include all political activities or candidate political messages in the form of verbal or nonverbal. The candidate's political message is conveyed during the campaign through props prepared by the General Election Commission such as billboards (outdoor media). In the election of the Governor and Vice Governor of Riau in 2018, the candidate's political message on the billboards was responded by the community in various ways as they wished. Based on this phenomenon, a study was carried out on the 'Meaning of Political Messages of Regional Head Candidates (Voters' Perceptions in the Election of Governor and Vice Governor of Riau in 2018)'. This study aims to explain people's perceptions about the political messages of Riau Governor and Vice Governor, 2018. The theoretical foundation used was the perception and theory of rock head audiences. The research approach used was qualitative through interviews and documentation as a data collection tool. Research subjects were voters, while the objects were candidates' political messages stated in billboards. The results of the study revealed that voters' perceptions of the political messages of candidate pair Syamsuar-Edy Nasution contained in the Billboards had four information, namely the characteristics/candidates' identities; political promises; inviting voters; and candidate pair jargon. The political messages of candidate pair Lukman Edy-Hardianto contained in the billboard had three information, namely the characteristics/identity of the candidate; political promises; and inviting voters. The political messages of the candidate pair Firdaus-Rusli Effendi contained in the billboard had five information, namely the characteristics/identity of the candidate; political promises; inviting voters; candidate pair jargon; and information on the voting schedule. Last, the political messages of candidate pair Arsyad Juliandi Rahman-Suyatno contained in the billboard had three information, namely the characteristics/candidate identity; political promises; and inviting voters.

## 1. Introduction

Election of Regional Heads abbreviated as Pilkada is a process of recruiting leaders in regions whose implementation mechanisms can be directly or indirectly. In direct elections, the community is a subject that assesses and elects candidates for regional heads, while candidates for Regional Heads (candidates) are objects that are assessed and chosen by voters.

Candidates as objects that are assessed include all political activities carried out both verbally and nonverbally. The activity is called a political message delivered with the aim of influencing voters. Therefore, the candidates must convey an interesting political message and provide benefits to voters. An interesting political message is a political message that provides benefits to voters (Arifin, 2011: 105).



The political message of the candidates can be known by the public through various media both delivered in dialogue such as limited meetings, blusukan (impromptu visit), and others as well as monologues, such as in outdoor media, namely banners, billboards, advertisements, and others. Political messages through outdoor media can be seen at highway intersections, residential areas, and other crowded places determined by the General Election Commission in the region.

The use of outdoor media is an effective channel for people to find out which candidates are competing in the elections. For the community, it is not only to find out who the person is, but also what the political promises of the candidate. This phenomenon was seen in Riau Province in Riau Governor and Vice Governor Election in 2018.

In the election of Riau Governor and Vice Governor 2018, political messages conveyed by the candidates through billboards were responded by the community in various forms of attitudes and behavior. Changes in attitudes and behavior of the community were shown with their support by using verbal and non-verbal symbols obtained through outdoor media. The symbols used by the community after seeing outdoor media were *tanjak*, jargon 'Riau lebih baik', jargon 'continue' and jargon 'governor zaman now'.

When viewed from various results of scientific studies regarding the candidate's political message, there are a variety of forms, such as research by Richard R. Lau, Ivy Brown Rovner from Rutgers University, and Lee Sigelman from The George Washington University. Research conducted in 2007 was concerning the impact of negative campaigns contained in political advertising. The result showed that public trust had declined slightly (not significantly) to the government. The research by Audun Beyer, Carl Henrik Knutsen and Bjorn Erik Rasch in 2014 was concerning surveys on electoral campaigns, focusing on issues and attention of voters in Norway. The results of this study showed that voters determined their choices based on political messages relating to the issue of immigration and development. Then Alia Middleton's 2014 study on the impact of visiting leaders in the regions in the general election campaign found that visits to constituents done by political party leaders in the UK had an impact on vote acquisition.

Based on these phenomena, researchers were interested in conducting a study entitled 'The Meaning of Political Messages of Regional Head Candidate (Voters' Perceptions in the Election of Governor and Vice Governor of Riau in 2018).

## **2. Reasearch Method**

This research deployed the social definition paradigm with interpretative-understanding or *verstehen* methods and used a qualitative approach. Research Subjects were voters in Riau Governor and Vice Governor elections in 2018, while the object of research was the political messages found in billboards for Riau Governor and Vice Governor of Riau candidates in 2018. In order to obtain data, in-depth interviews and documentation were used. Data was analyzed systematically by organizing data into categories, describing into units, synthesizing, composing into patterns, choosing which ones were important and what would be studied and making conclusions so that they were easily understood by own and other people.

## **3. Findings And Discussions**

### *3.1. The Candidates of Regional Head Election of Riau Province in 2018*

Based on the data from the General Election Commission of Riau Province, there are 4 (four) pairs of candidates for Governor and Vice Governor of Riau in 2018, namely:

- a. Candidate pair number 1: Drs. H. Syamsuar, M.Si as a candidate for Governor and H. Edy Nasution as a candidate for Vice Governor. This pair was backed by three political parties, namely the National Mandate Party (PAN), the Prosperous Justice Party (PKS) and National Democratic Party (Nasdem).
- b. Candidate pair number 2: Muhammad Lukman Edy, M.Si as a candidate for Governor and Hardianto, SE as a candidate for Vice Governor. This pair was backed by two political parties,

namely the National Awakening Party (PKB) and the Great Indonesia Movement Party (Gerindra).

- c. Candidate pair number 3: DR. H. Firdaus, ST, MT as a candidate for Governor and H. Rusli Effendi, SE, S.Pdi, M.Si as a candidate for Vice Governor. This pair was backed by two political parties, namely Democratic Party (Demokrat) and the United Development Party (PPP).
- d. Candidate pair number 4: Ir. H. Arsyadjuliandi Rahman, MBA as a candidate for Governor and H. Suyatno, AMP as a candidate for Vice Governor. This pair was backed by three political parties, namely the Party of Functional Groups (Golkar), the Indonesian Democratic Party of Struggle (PDIP) and People's Conscience Party (Hanura).

3.2. *Outdoor Media, Billboard of Candidates of Regional Head Election of Riau Province in 2018*

Billboards as a place for political messages of candidates for Riau Governor and Vice Governor 2018 are as follows:



Paslon 1: Svamsuar-Edv



Paslon 2: Lukman Edv-



Paslon 3: Firdaus-Rusli Effendi



Paslon4:

Figure 1. Billboards of Candidates of Regional Head Election of Riau Province in 2018

3.3. *Political Messages of Candidates in Regional Head Election of Riau Province in 2018*

Political messages, also referred to as political talks, are talks that can influence others (Nimmo, 2005: 75). Forms of political speech are in the form of verbal (words) and nonverbal (pictures, paintings, photos, films, gestures, facial expressions, and all means of acting). In detail nonverbal messages consist of 12 types, namely kinetics, eye movement, touch, paralanguage, silence, body posture, closeness and space, artifacts and visualization, color, time, sound, and smell.

The candidate's political message can be seen in the billboards for each pair of candidates for Governor and Vice Governor of Riau in 2018. Political messages both in verbal and nonverbal forms according to expert informant observations on the candidate billboards are as follows:

a. *Political Messages of candidate pair number 1, Syamsuar-Edy Nasution*

Based on the results of interviews with informants on 3 June 2018, there are 8 (eight) verbal political messages and 10 (ten) nonverbal political messages. The verbal political messages are (1) Developing Riau to be better; (2) Vote Number 1; (3) Syamsuar (candidate for Riau Governor); (4) Edy Nasution (candidate for Vice Governor of Riau); (5) G: @syamsuar.edy; (6) F: @syamsuar.edynast; (7) G:@riaulebihbaik; (8) #riaulebihbaik. While the nonverbal political messages of Syamsur-Edy Nasution's candidate pair are: (1) background color; (2) clothing color; (3) color of Candidate head cover; (4) the color of the Political Party logo; (5) the color of the Pilkada logo; (6) hand position; (7)

candidate smile; (8) forward eyes look; (9) form / type of candidate clothing; (10) types of candidate headgear.

*b. Political Messages of candidate pair number 2, Lukman Edy-Hardianto*

Based on the results of interviews with informants on 3 June 2018 there are 6 (six) verbal political messages and 10 (ten) nonverbal political messages. The verbal political messages are (1) Riau develops without corruption; (2) from below and Village; (3) Vote number 2; (4) Awakening village programs at least 1 billion per village per year; (5) Lukman edy-Hardianto; (6) The next Riau Governor and Vice Governor 2019-2024 ZAMAN NOW. While nonverbal messages are (1) background color; (2) clothing color; (3) color of head cover; (4) the color of the party logo; (5) the color of the election logo; (6) hand movements; (7) smile; (8) eyes; (9) form of clothes; and (10) type of head cover.

*c. Political Messages of candidate pair number 3, Firdaus-Rusli Effendi*

Based on the results of interviews with informants on 3 June 2018 there are 10 (ten) verbal political messages and 9 (nine) nonverbal political messages. The verbal political messages are (1) Remember to vote for number 3 on 27 June 2018; (2) Dr. H. Firdaus, ST, MT, candidate for Governor of Riau; (3) H. Rusli Effendi, SE, S.Pdi, M.Sc, Candidate for Vice Governor of Riau; (4) Make FIRDAUS-RUSLI; (5) Riau Madani Advances Fairly; (6) F: firdaus.rusli; (7) F: DR.H.Firdaus, ST, MT; (8) F: RusliEffendi; (9) Twitter: DR. Firdaus, MT; (10) Path: DOKTORFIRDAUS, MT. While nonverbal political messages were (1) badground color; (2) clothing color; (3) color of head cover; (4) the color of the party logo; (5) election colors; (6) smile; (7) eye gaze; (8) form of clothes; (9) type of head cover.

*d. Political Messages of candidate pair number 4, Arsyanjuliandi Rahman- Suyatno*

Based on the results of interviews with informants on 3 June 2018 there are 3 (three) verbal political messages and 7 (seven) nonverbal political messages. The verbal political messages are (1) Let's continue; (2) Prospective Governor of Riau: Ir.H. Arsyadjuliandi Rahman, MBA; (3) Candidate for Vice Governor of Riau: H. Suyatno, AMP. While the nonverbal messages were (1) badground color; (2) clothing color; (3) color of head cover; (4) smile; (5) forward eyes look; (6) dress form; (7) type of head cover.

*3.4. Voters' Perceptions of Political Messages of Riau Governor and Vice Governor Candidates in 2018*

Perception is the active process of selecting, organizing and interpreting people, objects, events, situations and activities. The process of forming perception begins with the selection of incoming stimuli regarding an object. It is strung together and makes it meaningful, then it is interpreted (Wood, 2013: 26).

In a contest such as the elections, political communicators must compose interesting political messages. According to Firmanzah (2007: 259-260), political messages must be in accordance with the political issues that are developing in society; the messages must be able to open and reveal about the occurrence of a problem that is being faced by the community; political messages are discourse and contain ways to solve; political messages must answer the needs of the community, so that they can get public attention.

Then political messages must also be packaged in such a way that they are easy to understand. For ordinary or low-educated people, political messages must be packaged as simple as possible so that they are easy to understand. The political messages conveyed must have their own identity, not only in accordance with party ideology but also easily recognized by the public.

Moreover, political messages conveyed by candidates should pay attention to the interests of voters. In the theory of stone head audiences, it is stated that audiences are only willing to follow the message, if the message provides benefits or meets the interests and needs of the audience (Arifin, 2011: 105).

*a. Voters' Perceptions towards Political Messages of Candidate Pair Syamsuar-Edy Nasution*

The perception of the political messages of the Syamsuar-Edy Nasution candidate pair originated from the selection process, the regulation and interpretation of voters on the political message contained in the campaign props, billboards (media of outdoor political communication). The following is the interpretation of voters on verbal and nonverbal political messages.

The verbal political messages of the Syamsuar-Edy Nasution pair are (1) Building Riau to be better; (2) Vote Number 1; (3) Syamsuar (candidate for Governor of Riau); (4) Edy Nasution (candidate for Vice Governor of Riau); (5) G: @syamsuar.edy; (6) F: @syamsuar. Edynast; (7) G: @riaulebihbaik; (8) #riaulebihbaik.

In accordance with the results of the interviews, voters first interpret the sentence, 'building Riau to be better' as a political promise that wants to change the state of Riau to be better than the current condition both in terms of physical development in the form of infrastructure, human resource development, and the level of community welfare in Riau Province . Second, the sentence 'vote number 1', means that the serial number of the candidate pair Syamsuar- Edy Nasution determined by the Provincial Election Commission is serial number 1. Then this candidate pairs invite the people of Riau to vote for them by voting number 1.

Third, the sentence, 'Syamsuar (Candidate for Governor of Riau) and Edy Natar (Candidate for Vice Governor of Riau), is the name of the candidate pair that is written without an academic degree, and this shows simplicity and humility. Fourth, the meaning of the sentence, 'Gmail: @ syamsuar.edy, Facebook: syamsuar.edynst, Gmail: @riaulebihbaik ' is as a medium of two-way communication between candidate pair and the community. This pair provides social media in order to make it easier to convey information to the public. Fifth, the meaning of the sentence '#riaulebihbaik' is a slogan or jargon of Syamsuar-Edy Nasution's candidate pair.

Then the nonverbal political messages of Syamsuar-Edy Nasution's candidate pair are (1) background color; (2) clothing color; (3) color of Candidate head cover; (4) the color of the Political Party logo; (5) the color of the Pilkada logo; (6) hand position; (7) candidate smile; (8) forward eyes look; (9) form/type of candidate clothing; (10) types of candidate headgear.

In accordance with the results of interviews with informants, it can be seen first the meaning of 'white and blue colors of background', where the blue color is the color of the sky which shows that the pair is sheltered by the sky; obey and submit to the highest authority, namely Allah SWT. While the white color shows this candidate pair has a sincere, holy and clean intention. Second, the meaning of 'the color of white clothes' is to describe a candidate pair who is sincere, has a good work commitment and is free from corruption. Third, the meaning of 'head covering color, skullcap' is nationalist pairs.

Fourth, the meaning of the 'hand downward' position is that the candidate pair is ready to work with full enthusiasm if believed to be the Governor and Vice Governor of Riau for the period of 2019-2024. Fifth, the meaning of 'smile' is showing joy, gentle in leading, close to the community. Sixth, the meaning of 'forward eye gaze' is showing a visionary pair.

Based on the meaning of political messages both verbal and nonverbal, there are four voters' perceptions of Syamsuar-Edy Nasution's candidate pair. First the candidate pair has characteristics or identities including (1) a pair who is faithful and devoted to God Almighty; (2) Candidate pair number 1; (3) Simple, humble, sincere and clean; (4) Work hard with enthusiasm; (5) Nationalist pair; (6) Pair who is cheerful, gentle in speaking and close to the community; (7) Visionary pair who has a far-sighted view in building Riau.

Second, Syamsuar-Edy Nasution candidate pairs have three political promises, namely (1) Building infrastructure; (2) Building human resources; and (3) Improving the level of welfare of the people in the province of Riau. Third, Syamsuar-Edy Nasution pairs invite the people of Riau Province to communicate with each other through social media that they have provided and invite the public to vote

number 1. Fourth, the Syamsuar-Edy Nasution candidate pair has a slogan or jargon to influence the community, namely #riaulebihbaik '.

*b. Voters' Perceptions towards Political Messages of Candidate Pair Lukman Edy-Hardianto*  
Perception of political message of candidate pair Lukman Edy-Hardianto started from the selection process, regulation and interpretation of voters on political messages contained in campaign props, billboards (media of outdoor political communication). The following is the interpretation of voters on verbal and nonverbal political messages.

Verbal political messages from Lukman Edy-Hardianto's pairs are (1) Riau develops without corruption; (2) from below and Village; (3) Vote Number 2; (4) Awakening Village programs at least 1 billion per village per year; (5) Lukman edy-Hardianto; (6) The next Riau Governor and Vice Governor 2019-2024 ZAMAN NOW.

According to the results of the interview, the voters first interpret the sentence, 'Riau develops without corruption' where Riau Province will move forward without corruption. Therefore, the candidate pair is committed not to commit corruption and fully support the eradication of corruption in Riau Province. Second, the meaning of the phrase 'from below and the village' is that this candidate pair will build Riau oriented towards the village community. Third, the meaning of the phrase 'vote number 2' is notifications to the people of Riau regarding the serial number of Lukman Edy-Hardianto pair and invites the public to choose it.

Fourth, the meaning of the phrase 'The awakening village program at least 1 billion per village per year' is that the candidate pair promises to prioritize development at the village level which is to provide a budget of 1 billion each year for each village in Riau Province. Fifth, the phrase 'Lukman edy-Hardianto' refers to the names of pairs of candidates for Governor and Vice Governor written without any academic degree and this shows a simple and humble pair. Sixth, the sentence 'The next Riau Governor and Vice Governor 2019-2024 ZAMAN NOW' means that the pair matches and suitable with the present era.

Then the nonverbal political messages of candidate pair Lukman Edy-Hardianto are (1) background color; (2) clothing color; (3) color of head cover; (4) the color of the party logo; (5) the color of the election logo; (6) hand movements; (7) smile; (8) eyes; (9) form of clothes; and (10) type of head cover

According to the results of the interview, first the meaning of 'white color of background' shows that the candidate pair has a pure and clean intention if they are trusted to lead Riau in the future. Second, 'yellow color of Lukman Edy clothes' is the typical color of Riau Malay to show him as the native of the region, while the meaning of Hardianto's white clothes is to show the sincerity of the intention and the cleanness of the person. Third, the black color of head cover refers to national skullcap color which shows that this pair has soul of nationalism. Fourth, the meaning of color of political party logo is to show the identity of political parties.

Fifth, color meaning of the election logo is the typical colors of Riau province. Sixth, the meaning of 'greetings by hand' shows a polite pair and always greets the community. Seventh, the meaning of 'smile' is a cheerful and friendly pair with the community. Eighth, the meaning of 'eye gaze in the future' shows the readiness of this pair to lead if trusted by the community; then also shows that the pair is close to the community, often meets and sees the condition of the community.

Based on the meaning of political messages both verbally and nonverbally, there are three voters' perceptions of the candidate pair Lukman Edy-Hardianto. First, the candidate pair has characteristics or identity including (1) a clean pair who does not commit corruption; (2) having sincere and pure intentions, humble and simple; (3) a candidate pair that fits in the current era, young and energetic; (4) native of the region; (5) nationalist candidate pairs; (6) a polite and popular pair.

Second, the candidate pair Lukman Edy-Hardianto have two political promises, namely (1) participating in helping to prevent acts of corruption and this pair do not commit acts of corruption; (2) carrying out

village development by giving a budget of 1 billion per village every year. Third, the candidate pair Lukman Edy-Hardianto invites the community to vote for them on the voting day.

*c. Voters' Perceptions towards Political Messages of Candidate Pair Firdaus-Rusli Effendi*

The perceptions of the political messages of the candidate pair Firdaus-Rusli Effendi originated from the selection process, the regulation and interpretation of voters on the political message contained in the campaign props, billboards (media of outdoor political communication). The following is the interpretation of voters on verbal and nonverbal political messages.

The verbal political messages of the pair Firdaus-Rusli Effendi are (1) Remember to vote for number 3 on 27 June 2018; (2) Dr. H. Firdaus, ST, MT, candidate for Governor of Riau; (3) H. Rusli Effendi, SE, S.Pdi, M.Sc, candidate for Vice Governor of Riau; (4) Make FIRDAUS-RUSLI; (5) Riau Madani Advances Fairly; (6) F: firdaus.rusli; (7) F: DR.H.Firdaus, ST, MT; (8) F: Ruslieffendi; (9) Twitter: DR. Firdaus, MT; (10) Path: DOKTORFIRDAUS, MT.

According to the results of the interview, the voters first interpret the phrase 'Remember to vote for number 3 on 27 June 2018' as a notification about the voting schedule that is on 27 June 2018, as well as inviting the public to choose serial number 3. Second, the meaning of 'DR. H. Firdaus, ST, MT, the candidate for Governor of Riau and H. Rusli Effendi, SE, S.Pdi, M.Si, candidate for Vice Governor of Riau' shows that this pair is competent, qualified partners who does not need to be doubted by the community to lead Riau. Fourth, the meaning of the phrase 'Make FIRDAUS-RUSLI' shows that this candidate pair expects public support to vote for them and win it. Fifth, the meaning of 'Riau Madani Advancing Fairly' is that the candidate pair promises to form a religious, fair and prosperous Riau community.

Sixth, the meaning of 'Facebook: firdaus.rusli, Facebook: DR.H.Firdaus, ST, MT, Facebook: Ruslieffendi, Twitter: DR. Firdaus, MT, Fath: DOKTORFIRDAUS, MT' is as a medium of two-way communication between candidate pair with the community. This pair provides social media in order to make it easier to convey information to the public.

Then the nonverbal political messages from the candidate pair Firdaus-Rusli Effendi are (1) background color; (2) clothing color; (3) color of head cover; (4) the color of the party logo; (5) election colors; (6) smile; (7) eye gaze; (8) form of clothes; (9) type of head cover.

In accordance with the results of interviews with voters, first the meaning of the colors of blue and green background shows the color of the political party backing the candidate pair. Firdaus is a cadre of the Democratic Party and Rusli Effendi is a cadre of the United Development Party. This color also shows a combination of nationalist and religious political parties. Second, the meaning of 'the pair white clothing color' is illustrating that the candidate pair in addition to showing sincere and pure intentions is also committed to clean performance.

Third, the use of Tanjak as a head cover shows the characteristics of Riau Malay. This illustrates that they are native pairs of Malay (Native of the Region). The hope is that Malay voters can choose this candidate pair.

Fourth, the meaning of 'smiles and eyes of the candidates' pairs, is this candidate pair is ready to work passionately. They are cheerful and gentle so that people can get close to them. Besides this pair will often meet and see the state of the community. This candidate pair is a visionary pair.

Based on the meaning of political messages both verbally and nonverbally, there are five voters' perceptions about the candidate pair Firdaus-Rusli Effendi. First, the candidate pair has characteristics or identities including, (1) Competent and qualified; (2) Close to the community; (3) Clean, holy, and sincere in their intentions; (4) Supported by nationalist-religious parties; (5) Native of Riau; (6) Work hard, excited at work; (7) Courteous and popular; (8) Visionary pair.

Second, the candidate pair Firdaus-Rusli Effendi have political promises that will shape the religious, just and prosperous Riau community. Third, the pairs have jargon or slogan to influence voters, namely Riau Madani Advances Fairly. Fourth, Firdaus-Rusli Effendi convey three invitations to the people of Riau, namely (1) to vote for the pair Firdaus-Rusli; (2) to ask the community to make this pair win; (3) to invite the community to establish communication through social media. Fifth, the candidates also provide information to the people of Riau regarding the voting schedule, which is 27 June 2018.

*d. Voters' Perceptions towards Political Messages of Candidate Pair Arsyadjuliandi Rahman-Suyatno*

The perceptions of the political messages of the candidate pair Arsyadjuliandi Rahman-Suyatno originated from the selection process, the regulation and interpretation of voters on the political message contained in the campaign props, billboards (media for outdoor political communication). The following is the interpretation of voters on verbal and nonverbal political messages.

The verbal political messages of the Arsyadjuliandi Rahman-Suyatno pair are 1) Let's Continue; (2) Prospective Governor of Riau: Ir.H. Arsyadjuliandi Rahman, MBA; (3) Candidate for Vice Governor of Riau: H. Suyatno, AMP.

In accordance with the results of the interview, the voters first interpret the sentence 'Let's Continue' as a way of the candidate pair to invite the community to support it. Supporting this candidate pair means that they will continue with the development that they are currently doing. This candidate pair will increase development in Riau province. Second, the meaning of 'Ir. H. Arsyadjuliandi Rahman, MBA (Candidate for Governor of Riau) and Suyatno, AMP (Candidate for Vice Governor of Riau) is that the candidate pairs are competent and qualified who are undoubtedly the public to lead Riau.

Then the nonverbal political messages of Arsyadjuliandi Rahman-Suyatno's candidate pair are 1) background color; (2) clothing color; (3) color of head cover; (4) smile; (5) forward eyes look; (6) dress form; (7) type of head cover.

According to the results of the interview, first the meaning of the color 'yellow background' shows the color of the bearer political party, Golkar. This intends to inform the people of Riau as well as invite Golkar voters to choose the candidate pair Arsyadjuliandi Rahman-Suyatno. Then the meaning of white color on the background means clean and holy. This pair has a pure and clean intention. Second, yellow colors of the candidate pair's clothes are characteristic of Riau Malay, which is to show that this pair is originally from Riau. Third, colors and types of head coverings in the form of skullcap are interpreted as nationalist pairs.

Fourth, the meaning of smiles and eyes of the candidates' pairs show a cheerful, friendly and close to the community. While the meaning of 'eye gaze' shows the leader who is ready to lead and will often meet and see the condition of the community.

Based on the meaning of political messages both verbally and nonverbally, there are three voters' perceptions of the pair Arsyadjuliandi Rahman-Suyatno. First, the candidate pair has characteristics or identities including (1) competent, quality; (2) supported by nationalist parties; (3) a nationalist pair; (4) native of Malay; (5) clean, cheerful, friendly and popular pair.

Second, this candidate pair has political promises, namely continuing development that has been ongoing and is being worked on. Third, the candidates invite the community to support them so that they can win the election of the Governor and Vice Governor of Riau.

#### **4. Conclusion And Suggestion**

##### *4.1. Conclusion*

a. Voters' perceptions towards political messages both verbal and non-verbal of the candidate pair Syamsuar-Edy Nasution are:

- 1) The candidate pair has characteristics that are faithful and devoted to God Almighty; Simple,

- humble, sincere and clean; Work hard with enthusiasm; Nationalist pair, cheerful, gentle in speaking and close to the community, and visionary
- 2) The candidate pair has political promises, namely building infrastructure; building human resources; and improving the level of welfare of the people in Riau province.
  - 3) The candidate pair invites the community to communicate with each other through the social media they have provided and invites the public to vote number 1.
  - 4) The candidate pair has a slogan or jargon to influence the community namely #riaulebihbaik '.
- b. Voters' perceptions toward political messages of candidate pair Lukman Edy-Hardianto are:
- 1) The candidate pair has characteristics including a clean pair, does not commit corruption; has sincere and pure intentions, humble and simple; the candidate pairs fits in the current era, young and energetic; Native of the region nationalist; polite and popular.
  - 2) The candidate pair has a political promise that is not to commit acts of corruption; develop villages by giving a budget of 1 billion per village every year.
  - 3) The candidate pair invites the public to vote for them on the voting day
- c. Voters' perceptions toward political messages of candidate pair Firdaus-Rusli Effendi are:
- 1) The candidate pair has characteristics including, competent and qualified; Close to the community; Clean, holy, and sincere in their intentions; Supported by the nationalist-religious party; originally from Riau; Work hard, excited at work; Polite, popular and visionary.
  - 2) The candidate pair has a political promise that is to form a religious, just and prosperous community of Riau.
  - 3) The candidate pair has a jargon or slogan to influence voters, namely Riau Madani Advances Fairly.
  - 4) The candidate pair submits three invitations to the people of Riau, namely to vote for the Firdaus-Rusli pair; to ask the public to make this pair win; and to invite the community to establish communication through social media.
  - 5) The candidate pair also provides information to the people of Riau regarding the voting schedule, which is 27 June 2018.
- d. Voters' perceptions toward political messages of candidate pair Arsyadjuliandi Rahman-Suyatno are:
- 1) The candidate pair has characteristics including competent, quality; Supported by the nationalist party; Nationalist pair; Native of Malay; a clean, cheerful, friendly and popular pair.
  - 2) This candidate pair has a political promise, namely Continuing Development that has been and is being worked on.
  - 3) This candidate pair invites the public to support them so that they can win the election of the Governor and Vice Governor of Riau.
1. Suggestions
- a. The candidates competing in the Election of Regional Heads are expected to prepare political messages that appeal to voters.
  - b. The General Election Commission is expected to place props, especially outdoor media such as billboards in crowded places as a means of information for the public to find out about the candidates.
  - c. Voters are expected to keep in mind about the political messages of the candidates as guidelines for determining choices.

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## ICT and Women's Empowerment: A Review from Development Communications Perspective

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**Abstract:** Information and Communication Technology (ICT) is growing rapidly in Indonesia, especially the internet. Data Association of Indonesian Internet Network Providers (APJII) revealed that 132.7 million Indonesians have used the internet. This data shows almost all circles using the internet. Not only in the city, but also in the countryside and in the coastal areas, many residents use the Internet by using a smartphone. Data also shows that the internet user is still dominated by men. Women are considered incapable and less capable in utilizing ICT. However, many research results emphasize that information technology or the Internet can help spread in improving social and economic processes. This paper examines about how ICTs and women's empowerment are in the perspective of development communication. This is because development should not be gender biased and there is an active participation of women in order to avoid discrimination. A case from Indramayu District of West Java province becomes a sample for this study. It revealed that there is a gender biased and women are willing to be empowered through utilizing ICT.

## **Gender Equality in Islam (Discourse Analysis Textbook 'Buya Hamka Berbicara tentang Perempuan')**

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The notion of equality of men and women was much discussed by Buya Hamka during his lifetime in a serialization in Panji Masyarakat magazine in the 1990s. In 2014, publisher Gema Insani Jakarta re-publish Buya Hamka's thought book entitled 'Buya Hamka Berbicara tentang Perempuan'. This is considering the importance of the Muslims in this century about Buya Hamka's idea of gender equality, so that Muslims, especially women, can safeguard aqidah, morals, and thoughts referring to the Qur'an and Hadith, and are proud of their Islam. The specific purpose of this study was to find out the textual discourse on gender equality in Islam contained in the book 'Buya Hamka Berbicara tentang Perempuan'. While the benefit of this research is theoretically for the development of knowledge and analysis related to contemporary issues required by Muhammadiyah Persyarikatan and stimulate further researchers in Muhammadiyah University's to study and explore more about gender in Islamic view. The study used the van Dijk model discourse analysis method which analyzed the microstructure of a text by observing semantics, syntax, stylism, and rhetorical. Subjects in this study is the text of the book 'Buya Hamka Berbicara tentang Perempuan'. The object of research is gender equality in Islam.

Keywords: Gender Equality, Buya Hamka, Discourse Analysis

# Utilization of Animation as Media Marketing Communication in Increasing Interest Visits To Tourism Destination of West Sumatera Province

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**Abstrac.**This study discusses the use of animation as a marketing communication medium in increasing the interest of visiting the tourist destinations of West Sumatera Province. The purpose of this study is to describe how the implementation of the use of animation media conducted by the Department of Tourism and Creative Economy of West Sumatera Province. in increasing interest to visit the West Sumatera tourist destinations and describe the interest of tourists see the media animation marketing communication tourism. The research method used is qualitative descriptive with informant research determined by purposive sampling and snowball sampling. The final result of this research is Tourism and Creative Economy of West Sumatera Province in promoting tourist destinations using various marketing communication media, one of them through animation media. Utilization of this animation is the right media in providing great opportunities in the promotion of West Sumatera tourist destinations, because the media animation is innovative, creative and interesting. Utilization of animation aims to provide information to introduce and promote tourist destinations for the level of visiting to various tourist destinations of West Sumatera increased. This animated communication media in the making is always innovate and creative in displaying animation that interesting and inspiring sense of like, and love for domestic and foreign tourists who see animation of West Sumatera tourist destinations.

## 1. Introduction

Indonesia is an archipelago country that has the potential of such an extraordinary nature, the diversity of flora and fauna, archaeological remains and historical heritage, culinary tour, as well as arts and culture, all of which is a resource and capital in the development and enhancement of tourism. The capital and resources must be utilized optimally through the holding of tourism that aims to advance the State of the economy. Tourism managed by Nice and right can attract tourists nusantara and foreign tourists to visit tourist sites that are required by each country to be able to increase the economy of tourism region.

Presiden Republic of Indonesia Mr. Jokowi stated, Indonesia has many tourist destinations that can attract a lot of foreign tourists. But in fact the number of foreign tourists to visit Indonesia less than Malaysia and Thailand. According to Jokowi, the low number of foreign tourists to visit Indonesia because the infrastructure is not yet adequate and packaging tourism products less attractive. This must soon be addressed if it is to developing Indonesia's tourism. Jokowi stated, the Government has conducted various attempts to fix this. Even tourist destinations Indonesia has now been promoted in various countries in the world.[1]

Some natural attractions in Indonesia are very diverse, one of them is natural attractions in West Sumatera, which are very rich in natural attractions such as Padang Beach and Gandoraih Beach in Pariaman, Carocok Beach in Pasaman, Maninjau Lake and Lake Singkarak, as well as tourism historic like Janjang Seribu, Goa Goa and Jam Gadang in Bukit Tinggi, Pagaruyung Palace in Batu Sangkar and

several other places in West Sumatra. All of these tourist attractions greatly affect the increasing number of domestic tourists and foreign tourists in the ease of obtaining information through the media.

Increasing the number of tourists visiting tourist destinations in West Sumatra, the West Sumatra Provincial Tourism Office has the field of creative media development in the media, design and science and technology as well as the field of tourism marketing which has duties and functions in media-based human resource development, design and science and technology and tourism promotion. Both fields are very influential in providing information and promotion of tourism objects in West Sumatra to domestic tourists and foreign tourists. With the development of media-based human resources, design and science and technology as well as tourism promotion can facilitate the Tourism Office in providing information and promoting tourism to people who are looking for tourist destinations in West Sumatra.

The large number of promotional media found by the public such as brochures, newspapers, magazines, radio and television advertisements and other social media makes people feel less interested and look ordinary because of the rapidly growing communication technology. By utilizing communication technology and the use of interactive media which is currently much loved and favored by children to adults, namely animation media.

Animation that was only used as an entertainment medium has now developed into a broader media, such as used for promotional media. West Sumatra Province Tourism Office in utilizing animation as a promotional medium by holding an animated film competition for young people who are innovative and creative in creating animated stories with the theme of Minangkabau culture. The existence of the animated film facilitates the West Sumatra Provincial Tourism Office in promoting various tourism in West Sumatra, such as animated film Piapi-Animation Pacu Itik Raih which won 1st place in 2016. [2]

This is also supported by the opinion of the West Sumatra Provincial Tourism Office not only promoting tourism through websites, pamphlets and other mass media, but also with animated shows. It is expected that with this animation, tourism in the Province of West Sumatra is increasingly famous. This was conveyed by the Secretary of the West Sumatra Province Tourism Office, Mr. Karnalis to Padang Ekspres Newspaper, on the sidelines of the 2016 animated film competition. "We will promote West Sumatra tourism with interesting animations. Of course, the purpose of promoting through animation is not only for promotion, but also for the space for creative industries to develop," he said. He said, the West Sumatra Provincial Tourism Office also invited young people who are creative and innovative to create interesting animations to promote tourism in West Sumatra. In addition to space for young people to be creative, it also opens up greater employment opportunities for animation makers. The Head of the Division of Creative Economy Development in the Media of Design and Science and Technology of the West Sumatra Province Tourism Office, Aprimas said the animation competition which was held began with an animation workshop March 28-30 2016. Where the 1st place won by Piapi Animation was Piai. The second winner was Kolilur Rahman Hendrata with the title Pesona Sumbar, Champion III Arisman with the title This Is Minangkabau.[3]

From the background of these problems, it is necessary to establish a new and unique marketing communication media such as the use of animation media in promoting tourism in the region. The existence of marketing communication media in animated films can make it easier for tourists to get interesting information and make it easier for the West Sumatra Provincial Tourism Office to provide information to tourists about tourist attractions in West Sumatra.

## **2. Theory and method**

### *2.1 Animation Media as a Tourism Marketing Communication Strategy*

The increasingly fierce competition in the business world has caused marketing strategy to become one of the most important parts of every business field, especially when information technology is developing so rapidly that it encourages the development of new marketing disciplines and concepts. Marketing is now better known as a knowledge based society that has changed the position of communication as the heart of marketing activities (Matari: 2008) in Pasarani (2012: 4). Even marketing in the information age today is marketing and communication, both of which have never

been separated (Etaswara, 2008) in Pascarani (2012: 4).

The target of marketing communication is not to sell products, but the target is customer knowledge of the product so that potential customers know and understand the product. It could be after the prospective customer knows the product he did not buy because of other considerations, but the information and knowledge that has been obtained from the marketing communication process is a future investment for a company that runs integrated marketing communication, because prospective customers who fail to buy the current product with knowledge complete about a product, he will buy a product that he has known later when he needs it (Bungin, 2015: 59-60).

Likewise the use of animation media in carrying out tourism marketing communications, will change customers in this case tourists become "agents of knowledge" who will tell others and other potential customers about tourism products in an area in terms of this research is tourism marketing communication marketed by the Tourism Office of West Sumatra Province. So that the West Sumatra Provincial Tourism Office does not need to pay more for the tourism marketing communication process because it already has knowledge investment in tourists as potential customers, through an animated media process about destination places in West Sumatra Province in marketing communications that have been conducted.

The main focus of marketing is to sell products to consumers, because with all existing sales channels, a seller (marketer) must be able to sell products to people. To achieve successful sales, in marketing recognize the concept of 4P (product, price, place and promotion) in (Bungin, 2015: 54-59), namely: 1). product (product) must have the character and advantages as a specific character that distinguishes our products from other products. In this study, the marketed product is a tourist attraction in West Sumatra Province which has a destination brand as one of the halal tourist destinations in Indonesia. 2). price is the quantity, quality and value given to a product, service and value itself. Prices offered in tourist destinations in West Sumatra are quite cheap and affordable prices and convenience to reach the tourist sites. 3). Place (place) is where goods are sold so as to make it easier for people to get the marketed goods. The place of the product must be close to the prospective buyer so that it makes it easier for the buyer to get the product. Places from tourist sites close to prospective buyers become one of the attractions in marketing. Tourist destinations in West Sumatra can be achieved with various existing facilities such as tour guides and transportation to go to tourist destinations in West Sumatra. 4) Promotion (promotion), products from tourist destinations must be promoted in marketing communication, because of promotions that introduce products to tourist destinations to many people, both private and public. Product promotion from West Sumatra tourist destinations is through animation media.

Promotion is all forms of communication used to inform, persuade or remind people of products produced by organizations, individuals / households. Promotion is one of the determinants of the success of a marketing program. Understanding the impact of promotion on consumers is that consumers must first be exposed to information. Then they must enter into promotional communication and understand its meaning. Finally, the knowledge, meaning and trust gained about the forms of promotion they receive will be integrated with other knowledge to create brand attitudes and make purchasing decisions (Pascarani, 2012: 7).

## *2.2 Concepts of Interest in Marketing Communication*

The concept of interest in the AIDDA model is the psychological process of the audience. Based on the AIDDA concept for audiences to take action, first they must be raised attention as the beginning of successful communication. If communication attention has been raised, it should be followed by an effort to foster interest, which is a higher degree of attention. Interest is a continuation of attention which is the starting point for the emergence of desire to do an activity that is expected by the communicator. There is only desire in the communicant, for the communicator does not mean anything, because it must be continued with the coming of a decision (decision), namely the decision to act (action) as expected by the communicator (Thill & Bovee, 2007) in (Bungin, 2015: 47)

The importance of mass media in communication is to maximize the role of messages in communication. In marketing, the role of mass media is very important as a marketing message catalyst. This communication process becomes maximal when the mass media is used as a medium in the process of delivering the message, as is done in advertising through mass media with all existing advertising variants. Likewise the communication process in conveying information about tourist destinations in West Sumatra Province which uses animation media as a tourism marketing communication media in West Sumatra. By utilizing this animation media can make it easier to convey tourist destination information easily by uploading animation about characters in West Sumatra.

### *2.3 Brands of West Sumatra Travel Destination*

Brand is everything, brands are not logos or symbols, brands are value indicators offered to customers. A brand is an asset that creates value for a customer. By strengthening satisfaction and loyalty, brand is the result that is run on the product. So a strong brand is a powerful product marketing tool (Bungin, 2015: 57).

The concept of West Sumatra tourism destinations has long been thick with the nuances of Islam as stated "Adat Basandi Syarak, Syarak Basandi Kitabullah" (Adat based on Religion, Religion based on the Book of Allah) and "Syarak Mangato Adat Mamakai" (Religion determines, custom uses). West Sumatra also has many tourist objects and Islamic museums with the support of amenities such as mosques and mosques, and even some old mosques which are the main attraction. In addition, West Sumatra is also the birthplace of several Minangkabau Ulama as well as National Islamic leaders such as KH Agus Salim, Ahmad Khatib Al-Minangkabawi, Buya Hamka, Rasuna Said, Tuanku Imam Bonjol and many more. Other supporting factors are hospitality accommodation and other types of accommodation, most of which are equipped with prayer rooms, Qibla direction, prayer devices, the Koran and of course halal food. [4]

With the existence of a strong West Sumatra brand with Islam, it can be a special attraction for Muslim tourists both domestic tourists and foreign Muslim tourists. carrying the theme of West Sumatra is halal tourism will improve tourism promotion to be better supported by facilities and infrastructure and ease, speed of accessing information and ease of transportation to be able to get to the place of tourism.

### *2.4 Research Methods*

The approach used in this study is a descriptive qualitative approach. Descriptive research is research that describes a symptom, event, event that occurs at the present time. This is based on the consideration that researchers want to understand, examine in depth and explain the material studied in the study. In this study, the author wants to examine the use of animation media as a marketing communication medium in increasing interest in visiting West Sumatra tourism destinations by the West Sumatra Provincial Tourism Office.

Data collection techniques that I use in accordance with descriptive qualitative research methods are 3 data collection techniques namely observation, in-depth interviews and documentation techniques.

### *2.5 Research Informants*

The informants in this study are:

a. Main Informant. The main informants in this study were several authorized officials from the West Sumatra Province Tourism Office. The informant in this study uses snowball sampling technique, where the sampling technique is done where the sample is obtained through a rolling process from one respondent to another respondent.

b. Key Informant. The key informants in this study were several domestic tourists and foreign tourists who saw animation media and visited West Sumatra Province. The informants in this study used purposive sampling, which is one of the non-random sampling techniques in which the researcher determines his own sampling by setting specific characteristics that are in accordance with the research

objectives desired by the researcher so that it is expected to answer the problem of this research.

### *2.6 Research Location*

The research was carried out at the Tourism Office of West Sumatra Province. This location is located at Jalan Khatib Sulaiman No. 7 Padang West Sumatra and the location of tourist informants visiting the West Sumatra Province. This research was conducted in December 2017 until August 2018.

### **3. Results and discussion**

The tourism service of West Sumatra Province has several fields including Marketing, Creative Economy, Tourism Destination Development and Human Resources. In the section on Creative Economy according to Law No. 23 of 2014 discusses specifically the ins and outs of the Creative Economy section which has 16 sub-sectors that must be developed including Animation and Visual Communication Design. In this case the development of products from community works such as animation. In the field of animation the work that has existed since the establishment of the 2015 Creative Economy Agency is in the form of the implementation of the use of animation media carried out by the Department of Tourism and Creative Economy of West Sumatra Province which in 2016 held an animation film competition which began with 28- March 30, 2016. With the holding of the animation contest, the winner was Piapi Animation with the title Pacu itiak. Second Place Winner Kolilur Rahman Hendrata with the title Pesona Sumbar, Champion III Arisman with the title This Is Minangkabau.

As a Creative Economy in charge of utilizing products from the public, the Marketing Department of the West Sumatra Province Tourism Office utilizes these products to be marketed in tourism. This is also in accordance with the Regulation of the Head of the Creative Economy Agency No.1 / 2015. Article 94 explains that the Marketing Deputy has the task of formulating, establishing, coordinating, and synchronizing policies and programs for developing branding, promotion and publication of creative economic products at home and abroad. [5]

The emergence of a community that is active in the work becomes the spotlight and attention of the government. Because of the small potentials of the community seen by the government so that the existence of the Creative Economy Agency provides a forum for collecting and introducing the wider community to the work in several communities throughout Indonesia. This is also in line with the words of the President of the Republic of Indonesia, namely Mr. Joko Widodo to continue to produce creative and innovative works as he was the initiator of the idea to establish this Creative Economy Agency. Creative and innovative work is a very valuable resource compared to natural resources that can run out because they are always used every time. With the role of government as the Creative Economy field can help in terms of supporting quality human resources, capital that can be used and marketing communication strategies with all these potentials can be used optimally so that they can create creative works in order to boost the welfare of the Indonesian people who start marketed these creative products to the international market.

Judging from the opportunities for animation and human resources that exist in West Sumatra, and the existence of the Creative Economy Agency that has been established since 2015, which has conducted a survey to record the creative economic actors in several cities in West Sumatra that show that the economic majority this creative from 16 sub-sectors is more dominant in 3 sectors of 16 creative economic sub-sectors namely Culinary, handicraft, and fhasion. So these 3 sectors are a priority for the future carried out by the Tourism and Creative Economy service in developing the economy of the community. this does not exclude other subsectors. Likewise, surveys in other provinces in Indonesia show that the survey results are almost the same in the three sub-sectors that become a priority, while the lack of animation according to Mrs. Agustin as the Human Resources Development and Business Protection Section at the West Sumatra Tourism Office. (interview July 23, 2018)

Using the media in tourism marketing communication makes it easier for this agency to find the desired tourists by using the strategy carried out by the West Sumatra Tourism Office in increasing the number of tourists visiting West Sumatra Province by looking at the market. Which is to study the market profile



of tourists, as we pursue the target of visiting tourists from Malaysia and we do not sell Mentawai because the type of tourists from Malaysia is not to Mentawai. Well, if you want to sell Mentawai, we have to sell to tourists from Australia. Because the interest of tourists from Malaysia is more like shopping at tourist destinations, as well as tourists from China who turned out to prefer sea / nautical and originated according to Riza as the Marketing Section team at the West Sumatra Tourism Office. (interview July 16, 2018)

Using a specific strategy in marketing communication by knowing the profile of tourists can sell products of tourist destinations that they have. By getting to know a number of tourists, for example from Europe and Australia, by first knowing the will of the tourists, what they want and what they promote. So instead of promoting what we have then we promote, this is a wrong promotion. With this strategy that is carried out on tourists so that interest in visiting tourist destinations in West Sumatra increases.

According to Riza as a team in the West Sumatra Tourism Department in utilizing animation media as a tourism marketing communication media does not have its own animation for marketing West Sumatra tourism destinations. Honestly, we don't have special animations for tourism promotion. Even in 2015 and 2016 we have animated films but for the use of animation itself in our tourism promotion we are still minimal. But we have a plan in that direction. Media that is often used by the West Sumatra Provincial Tourism Office in tourism marketing communications to this day, still uses social media and online media. And we use these media often compared to the print media or other media that we have. Examples for social media such as cable pickers, Instagram, Facebook from the West Sumatra Provincial Tourism Office. (interview July 16, 2018)

This is very unfortunate where the West Sumatra Tourism Office which has collaborated with the Creative Economy Agency and Ainaki Community (Association of Indonesian Animation and Creative Industries) West Sumatra does not take advantage of opportunities to cooperate in making animation as a tourism marketing communication media. The opportunity to utilize this animation is very large, where a lot of human resources in this case the West Sumatra animation makers who have good expertise in making animation, this is evidenced by the existence of an animation competition in 2016 and producing good works for national standards.

Evidence from the work that has been produced by the animation community in West Sumatra (Ainaki) that successfully raised the local character of West Sumatra can be seen from the works that have been posted on the Ainaki community's Instagram and Facebook, including animations that have been made from the studio. the show of Pandeka, which tells the story of old martial arts and from Piapi Animation, makes an animation about the pacemaker that tells about the tradition of the Minang people who held a duck race. while from Kenaris made an animation about silat and from Sapilin the studio made an animation about the origin of Minang Kabau, and Animated Andalas made about the mourning of mother. all of these animation results have good standards. From the studio, they made an animation of the show of pandeka, which has been recognized in Jakarta, which admires the martial arts movement that is truly martial arts. Interview with Taufik Gusman as Founder of Marawa Studio, Lecturer of Padang State Polytechnic and Chair of the Ainaki Community (Association of Animated and Creative Industries) West Sumatra. (Interview August 13, 2018)

Not running every year the animation festival competition is due to the lack of regional budgeting and different funding budgets in each region. In the field of the Creative Economy sector there are 16 sub-sectors, the running of the animation competition that was held 2 years ago in 2015 and 2016, while there are still many other sub-sectors developed by the Creative Economy in the Sub-Division of the West Sumatra Tourism Office, where this is obstacles. Likewise in terms of making animation that was first made is the character of the animation that will be lifted, creating local characters from an area becomes important according to Mrs. Agustin as the Human Resources Development and Business Protection Section in the West Sumatra Tourism Office. (Interview July 23, 2018)

No animation festival competition activities went on in 2017 and 2018 the previous year ever carried

out in the year 2015 and 2016 by the Tourism Office of West Sumatra Province because of the existence of the problem of funding. This is unfortunate because the years 2015 and 2016 the productivity works Ainaki Community kids West Sumatra looks very nice and also been national champion, working on international projects and also project the national advertising such as advertising Proris made by the Studio, according to Marawa Taufik Gusman (interview August 13, 2018)

Progress of the Ainaki community of West Sumatra this is just training animations which are usually held in Bali. Animation training in West Sumatra on August 10, yesterday. and from the Ainaki Community of West Sumatra was declared champion of the 1 in the creative economy expo Padang city year 2018 at the sweet water Beach yesterday that compete with 16 other subsector of creative economy such as culinary, fashion and all subsector other creative economy. This is proven because West Sumatra Ainaki win from the presentation and an interesting and innovative concept, according to Taufik Gusman (interview August 13, 2018)

In terms of the use of the communication media to promote tourism marketing tourism destinations West Sumatra which was conducted by the Tourism Office of West Sumatra using media website and some other media. And it depends on the participation of Tourism Office of West Sumatra into the promotional activities of tourism like in Singapore which brought the media in the form of photos, videos to the event and aired there. This became the promotional materials of West Sumatra Tourism Office. Just media animations from this moment can not promote because of the Tourism Office of West Sumatra Province had no. only the video animation which are contested year 2015 and 2016 that utilized the video for publication Tourism Office of West Sumatra Province, according to the Bu Agustin as the team team of human resources development and Protection Efforts at the Tourism Office West Sumatra. (interview 25 July 2018)

While on the drag experienced by the Tourism Office of West Sumatra in utilizing media animation as a media marketing communication in enhancing the interest in visiting tourists to destinations West Sumatra experienced some constraint. among them are the problems that arise in the conduct of regional tourism marketing that exists in Indonesia is how the commitment from Government, community and business agents or those in developing tourism destination tourist attractions get better and develop. So also with the province of West Sumatra, in implementing regional tourism destination marketing communications experience problem, as said by Riza Chandra team as part of the marketing strategy and Brand of Tourism Office of Pariwisata Province West Sumatra (interview 16 July 2018) says that our barriers in the development of tourism is the first, concerning the understanding of the people or tourists who are still minimal. The existence of pro cons, the existence of a case of small cases happening in the destinations in terms of trash scattered about, parking is expensive, and it's a challenge for us, but thank God up to now been a couple destinations places already addressed, such as the coast of Padang. Although there are laws or rules to fix the destinations it is the duty of the county town, but we are obligated to build the province as a district of the city. We have tourist destinations that become icon, and we can't rely on one site only. Since we spoke in the sphere of West Sumatra Province.

Based on the number of tourists visit the archipelago to the West Sumatra Province average 3 cities such as Tanah Datar, BukitTinggi and the southern coast 3 locations which contributed the favorite tourist destinations in the province of West Sumatra. However, Tourism Office of West Sumatra still do efforts to fix these problems include enhancing security at the site of tourism destinations and keeping information on tourist destinations such as price the food, the price of parking at the location visited by tourists sights, to make tourists feel happy and comfortable in order to arise the interest to visit tourist destinations of West Sumatra in the foreseeable future.

Based on data from BPS (Statistics Indonesia) West Sumatra Province the number of foreign tourists who visited the Sumatran Minangkabau International Airport via West (BIM) June 2018 reach 4,549 people, experiencing an increase of 51.53% compared to may 2018 recorded as much as 3,002 people. When compared with June of 2017, foreign tourists in June 2018 experienced an increase of 50.53%. foreign tourists in June 2018 contributes of 0.35% to the total foreign tourists to visit Indonesia (foreigners and National 1,318,028 people. [6]

This shows that the interest of domestic travelers and foreign tourists has increased and stable although numbers were not so much. but has the potential for revenue income is good enough for the region to West Sumatra. By always keeping a good image of the tourist potential and tourist destinations such as culinary, and other sights.

Some foreign tourists and travelers archipelago when looking at animated story about a typical region of West Sumatra that animation is the animated film race results March 2016 conducted by Provincial Tourism Office West Sumatra is feeling happy and love the stories created by the makers of the animated West Sumatra but at least the animation is created so that less can provide interest and interest to see the animation. The reason tourists nusantara and international tourists interested to West Sumatra Province was due to have the hospitality, culinary tourism engrossing, and the event of Tour De Singkarak that had already been successful and world-making West Sumatra Province became a glance of tourists. It can be seen from the influx of West Sumatra Province to 10 best tourism places in Indonesia and become the world's fifth position after France, Italy, Spain and China Bicycle Racing event in the world. The existence of this event make West Sumatra to easily promote its tourism to the national and international levels.

#### 4. Conclusions

Based on the results of this research, then the conclusion can be drawn:

1. animation as a medium of communication Opportunities of marketing of tourism is not well utilized and maximized by the Tourism Office of West Sumatra due to the lack of or limited budget funds while another subsector of Creative Economy must also be in see its potential so that human resources are not only creative advance in one subsector only but to all 16 subsector.
2. The activities of the community of Ainaki (Animation and creative industry association) West Sumatra is currently looking for qualified human resources so that a good and interesting work would have been followed. Looking for quality human resources for national and international animation industry is not easy, it takes time and patience as well as perseverance in providing the best for animation production. The existence of the Agency's Creative Economy has 16 subsector includes that animation has a great opportunity because of creative industries in Indonesia are being voiced by many Government and got a nice support from businessmen animation industry and the animation industry is valued very expensive.
3. not only utilize media animation alone but also other media in promoting tourist destinations in West Sumatra such as photos, videos uploaded on social media and the website of the Tourism Office of West Sumatra still contributes a good for visiting of tourists interest in domestic and overseas visit to West Sumatra as evidenced by the growing number of tourists based on data from BPS (Statistics Indonesia) West Sumatra Province that the number of foreign tourists who visit to West Sumatra, Minangkabau International Airport June 2018 reach 4,549 people, experiencing an increase of 51.53% compared to may 2018 recorded as much as 3,002 people.

As for advice for this research are:

1. Tourism Office of West Sumatra should always utilize media animation which tells the local character of the various areas in West Sumatra because of this animated media opportunities in the future are very wide open let alone animation makers West Sumatra has been gathered in community Ainaki (Asosiation animation industry and creative) West Sumatra that has the expertise to create animation with the industry standard.
2. animation makers in West Sumatra more enterprising yet make a good animation and innovative than ever before by always given training and formed a team of solid and compact, and the Government must always support the animation community in West Sumatra by providing capital and virtual office space as a place for them to be able to gather together in animation projects in order to produce work of a nice animation.

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## **Society Perspective towards Forest and Land in the Tenurial Conflict Area of Tesso Nilo National Park**

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**Abstract.** One of the society's main problems that live around Tesso Nilo's area is the less of economy choices in sustainable that make them possible to live side by side in harmony with the Tesso Nilo forest. Another problem that also comes this time is the appearance of land use conflict (tenurial) among the custom societies with the companies of concession holder in the land. There are the research goals are: First, Identifying the economy social characteristic of the society in the Village of Lubuk Kembang Bunga. Second, analyzing the society's perspective about the forest and the land in the tenurial conflict area of the Village of Lubuk Kembang Bunga. This research is designed using Mix Method with main method that is used is qualitative and quantitative method as the main method supporting. There is also the research result is the villager of Lubuk Kembang Bunga is classified heterogent, this thing is seen from many existences of the comers that enter to the village from various ethnics. Most of geography condition of Lubuk Kembang Bunga Village is plantation, animal husbandry, tourism (National Park of Tesso Nilo), protected forest and water source. Based on the knowledge of culture and society's adaptation experience with the nature environment, in general the original villagers of forest area of TessoNilo have categorization system of land and forest use that are in the environment on four parts, namely: settlement, polak, unirrigated agricultural field/garden, and forest.

**Keywords and phrases:** perspective, forest and land, tenurial conflict, Tesso Nilo National Park, Indonesia.

### **1. Introduction**

Riau province with 94.560 km<sup>2</sup> is the largest province in Sumatra Island. From the dry land potential proportion in this province as big 9.260.421 ha, more or less 2.47.952 ha or 26% has been allocated and used for the development of plantation plant and Industry Plant Forest. Undenied that the effort of plantation and Industry Plant Forest that most part is organized by the companies in big scale have given development positive value, included its contribution for the region income. Nevertheless, as long as the intervention of program and investment in big scale like that are not accompanied the attention of development toward various micro and traditional economy activities that are usual becomes the life support of most villagers surroundings, so the goal of region economy growth and development even distribution that is sustainable determined also will be difficult to be reached. This thing is reflected from the poverty problem is still heavy that is faced by the villagers around the capital accumulation activity location of big companies of the plantation contractor and the Industry Plant Forest.

The condition that is more worried usually happens in the area of settlement that borders on the forest area. The companies in big scale of concessionholder of HPH and Industry Plant Forest are often still dominant submitting to the opinion orientation of mainstream making use the forest and the land with the goal of wood exploitation. In the exploitation practice of natural resource like this, the attention toward the economy value such as the non-wood forest result and the function of ecology and social from the existence of the forest are often ignored. The giving of concession right to the companies in big scale and land conversion that is held even often causes the environment damage threat, the function

of forest ecology becomes disturbed, land produced of the farmers of the settlement gets more narrow and the inhabitant's pressure toward the forest also gets more increasing. The capital accumulation activity existence in big scale apparently also hasn't yet given the contribution for the villagers around it that still depend on the sector of agricultural and other economies in small scale. ironic, in several directions of settlement that previous were known with the harmony traditional life, then also experienced social change such as traditional values became lax, the role of traditional institutions faded or the legitimation of traditional leader was less.

This situation unexception also happens in the area of TessoNilo forest in Riau Province. In the area of tropical forest of the biggest lowland in this Sumatra Island has occurred the forest function transfer process that was formerly as the health source of germ plasma and biological diversity, unique fauna habitation, oxygen producer, arranging micro and macro climate, absorbing disturber gas of ozone layer of glass house effect cause that increases earth temperature, protects the land and landwater, producer of forest product such as latex, honey, fruits, medicines, animal protein, rattan, resin and wood and means of livelihood source of villagers around now experience various interest clash. The long chain of the interest clash process includes the fact of forest logging in big scale for the wood industry, the function transfer of heterogent primer forest becoming homogent plant forest and big plantation opening not only threat the biological diversity perpetuation, but also have caused negative impact for the existention of local society. With together recently, the use of forest resource in excessive by the society also happens that is around the forest because of the constriction of the land as main pole of their means of livelihood. Not only because of inhabitant growth naturally in that area, but also because of the migration increase that accompanies the land occupation rate and forest function transfer becoming other functions, included for the permanent settlement.

According to the report of WWF Indonesia, the villages that border on TNTN in this Riau Province until now has still experienced various development problems, especially in the economy social sector. This problem includes the problem of internal economy imbalance of intervillage and the interest conflict complexity intersides. The economy level of transmigration villages example are drawn tending to be better than with the villages that are occupied by the majority of local inhabitant.

One of the society's main problem that lives around the area of TessoNilo is less of economy choices in sustainable that make them possible to live side by side in harmony with the forest of TessoNilo. Another problem that also comes this time is the coming of land use conflict between custom society with the companies of concessionholder in the area.

## **2. Literature Review**

A process of meaning that is done by every individual toward the environment and aspect outside themselves that consists of the process of externalization, internalization and objectivities. The externalization is the self-adaptation with the sociocultural world as human product, the objectivities is social interaction in the intersubjective world that is instituted or experiences institutionalization process, and the internalization is individual identifying the self in the middle of social institutions where the individual becomes the member.

The term of social construction of reality is defined as social process through action and interaction where individual creates in continuously a reality that is had and experienced together in subjective. (Poloma, 2004:301)

The origin of social construction from Constructivism philosophy that is started from cognitive constructive ideas. According to Von Glasersfeld, the meaning of cognitive constructive came in the writing of Mark Baldwin that is deepened in wide and spreaded by jean Piaget. But if observed, exactly the main ideas of constructivism has been started by GiambattistaVico, an epistemology from Italia, he is pioneer of Constructivism. (Suparno, 1997:24)

In the philosophy ideology, the idea of constructivism has come since Socrates found the soul in the human's body, since Plato found the common sense and idea. (Bertens, 1999:89). The idea was more

concrete again after Aristoteles introduced term, information, relation, individual, substation, material, essention, etc. He said that the human is social creature, every opinion has been proven the truth, that the knowledge key is fact (Bertens, 1999:137).

The social construction is a theory of contemporary sociology that was sparked by Peter L. Berger and Thomas Luckman. In explaining the constructivism paradigm, social reality is social construction that is created by the individual. The individual is free human that does relation among one human with others. The individual becomes decision maker in social world that is constructed based on its wish. The individual is not the victim of social fact, but as production media and creative reproduction in constructing the social world. (Basrowi and Sukidin, 2002:194)

Berger and Luckman have opinion that the fact is built in social, so the sociology of knowledge must analyze the happening process. In the meaning of individuals in the society that builds the society, so the experience of individual is not separated with the society. Weterssaid that “they start from the premise that human beings construct social reality in which subjectives process can become objectivied”. This thought maybe that provides the basis of contemporary sociology theory of “social construction”. (Basrowi and Sukidin, 2002:201).

### **3. The Research Method**

This research is designed using Mix Method with main method that is used is qualitative and quantitative method as the main method supporting. This qualitative research is defined as an inquiry process to understand the problem of humanity and social based on complex difficulty, holistic illustration, shaped through the words, opinion from the informants reported in detail, and done in natural setting. (moleong, 1995; Bogdan and taylor, 1998).

The main data that will be made from this research such as qualitative, with supporting by the quantitative data. The quantitative approach that will be used in this research is by using survey method, namely by using the same systematically question to many people (questioner), then all answers that are obtained by the researcher noted, processed, and analyzed (Prasetyo and Jannah, 2015).

#### *3.1. The Social Characteristic of The Society and The Demography*

The village of Lubuk Kembang Bunga is in the main road of RAPP. The width of village area of LubukKembang Bunga is 7.014 ha, that is used for the location of the road as wide 32 ha, the location of the funeral as wide 1 ha, the location of public infrastructure as wide 1 ha, the location of plantation of rubber and road as wide  $\pm 300$  ha and the plantation of palm oil and the road as wide 2000 ha. The distance of Lubuk Kemnbang Bunga Village to the capital of Ukui Sub district 30 km. The distance of Lubuk Kembang Bunga village to the capital of Pelalawan Regency  $\pm 100$  km and the distance of Lubuk Kembang Bunga to the capital of Riau Province =150 km.

The condition of soil surface in the village of Lubuk Kembang Bunga is the swamp around 10% lowland about 55% and highland/range of hills about 35%. The weather condition in the village of Lubuk Kembang Bunga consists of two seasons namely dry season with the temperature average 30<sup>0</sup>C until 40<sup>0</sup>C, and wet season with the rainfall level 800 mm pro year, but in this time it's difficult to be estimated when the wet season and the dry season because the dry and wet season are not indeterminate.

The most of geography condition of the village of Lubuk Kembang Bunga is plantation, animal husbandry, tourism (TessoNilo National Park), Protected forest and water source. The village of Lubuk Kembang Bunga consists of 2 villages far from urban area, 7 Neighborhood Associations and 21 Administrative Units. The villages far from urban area of 1 and 2 are the place of village origin people to live. The total of inhabitant is 3448 souls. The total of men inhabitant is as many 1796 souls. And the total of women is as many 1652 souls. There is also the family sum as many 803 family cards, with the majority of Prosperous Family I. The inhabitant distribution of village of Lubuk Kembang Bunga based on the prosperity level can be seen in the table 1 as followings:

**Tabel 1:** The Distribution of Villager of Lubuk Kembang Bunga According to The Prosperity Level.

Nr	Prosperity Level	Total of Family Card	Percentage
1	Praproperous Family	75	9,34
2	Properous Family I	370	46,08
3	Properous Family II	323	40,22
4	Properous Family III	35	4,36
<b>Total</b>		<b>803</b>	<b>100,00</b>

Source: Profil of Lubuk Kembang Bunga Village, 2017.

From the above table, it can be seen that the most of villagers of Lubuk Kembang Bunga according to the prosperity level are prosperous family I that reaches 370 family cards or 46,08% from the total of inhabitant. From the above table, it also can be concluded that the people of the village of Lubuk Kembang Bunga that are still classified poor are the praproperous family as many 5 family cards or 9,34% from the total of inhabitant.

Mean while, for the society's education in the village of Lubuk Kembang Bunga, a big part of inhabitant is graduated from elementary school namely 39,59%. For more clear, it can be seen in the table 2 as followings:

**Tabel 2:** The Distribution of Villager of Lubuk Kembang Bunga According to the Education Level

Nr	Education Level	Men (soul)	Women (soul)	Total (soul)	(%)
1	Kindergarden	25	30	55	5,64
2	Ungraduated from Elemntary School	40	52	92	9,44
3	Graduted from Elementary School	100	186	386	39,59
4	Junior High School	67	71	138	14,15
5	Graduated from Junior High School	50	143	193	19,79
6	Senior High School	40	60	100	10,26
7	University/Academy	5	6	11	1,13
<b>Total</b>		<b>327</b>	<b>548</b>	<b>975</b>	<b>100,00</b>

Source: Profil of Lubuk Kembang Bunga Village, 2017.

From the above table, it can be seen that the most of villagers of Lubuk Kembang Bunga is graduated from elementary school, namely as many 386 souls (39,59), meanwhile the least is graduated from university, namely as many 11 souls (1,13). This thing shows that the education level in the village of Lubuk kembang Bunga is still low.

The villagers of Lubuk Kembang Bunga this time is enough heterogent although the majority from inhabitant is from the tribe of Pelalawan Malay. Such the table 3 as followings:



**Tabel 3:** The Distribution of Villager of Lubuk Kembang Bunga according to the Tribe

Nr	Tribe Name	Total (soul)	Percentage
1	Malay	1.642	47,62
2	Java	625	18,13
3	Minang	75	2.18
4	Batak	1.106	32.07
<b>Total</b>		<b>3.448</b>	<b>100,00</b>

Source: Profil of Lubuk Kembang Bunga Village, 2017.

From the above table, it's seen that the inhabitant of Lubuk Kembang Bunga village has been heterogent, this thing is seen from the existence of the comers has been many that enters to the village. Many comers that live in this village are not separated from the existence of palm oil Company that operates in the village area that absorbs many labors from out of the village. Hence, malay tribe is still the most dominant to live in the village area of Lubuk Kembang Bunga namely as many 1.642 souls or 47,62%, meanwhile the least is minang tribe as many 5 souls or 2, 18%. The original inhabitant of this village is malay tribe.

The faith system of villagers of Lubuk Kembang Bunga is based on Muslim teaching that becomes the establishment basic from social norm that is valid in the society.

**Tabel 4:** The Distribution of Villager of Lubuk Kembang Bunga according to the Religion

Nr	Religion Name	Total (soul)	Percentage
1	Islam	2.641	76,59
2	Christian	807	23,41
<b>Total</b>		<b>3.448</b>	<b>100,00</b>

Source: Profil of Lubuk Kembang Bunga Village, 2017.

From the above table, it's seen that the villager of Lubuk Kembang Bunga according to the most religion is Muslim as many 2. 641 souls or 76,59%, meanwhile the rest is Christian as many 807 souls or 23,41% that is the comer that comes from North Sumatra.

### 3.2. *The Economy System and The Means of Supporting*

The society of Lubuk Kembang Bunga village does the agricultural activity only for planting the vegetables and chili that are used to fill the own need, not to be traded. In the plantation sector of rubber and palm oil. This plantation sector that becomes the economy supporting of the society. In the fishery sector of this village, there is fish pond, but the fish pond is not managed as an effort, so the fish cultivation is only limited for the own need fulfillment and filling their hobby. And in the animal husbandry sector of this village, raising chicken, breeding goat and cow but it's not processed as effort that can be traded in planned, so it can also be concluded that the society that raises chicken, goat and cow has goal to fill the own need and fill their hobby.

In the village of Lubuk Kembang Bunga, there is no the mining. For the industry activity, in this village there is the factory of palm oil that belongs to the company. The villagers of Lubuk Kembang Bunga are smart to make the house and those can also fix the motorcycle, so the service activity that is available in this village is the service activity of building and service of motorcycle repair. In the sector of trade, in this village, there are small shops, meanwhile the result of rubber plantation and palm oil plantation are sold to the collector from inside or outside of the village.

For filling the need of fresh water daily, the villagers of Lubuk Kembang Bunga obtain from the hoist dig well as many 15 units that consist of 8 units of public well and 100 units of private well of the society, where this public well cab be used by the society. Besides from the public well, the society also obtains the water from the river as wide  $\pm 8$  m. When the dry season, the villager of Lubuk Kembang

bunga still experiences the difficulty to obtain the water because the well water is dry and the river is far from the house.

The villager of Lubuk Kembang Bunga does the garbage disposal behind each house and then being burnt. The sanitation of most society is thrown or flown behind each house that generally doesn't use the tank of septik. There are  $\pm 10\%$  villagers of Lubuk Kembang Bunga that has not yet used standard toilet, still uses open latrin. In the village of Lubuk Kembang Bunga, there is not yet standard drainage, that has only moat that is made by the society or the gerder motor when it fixes the road. In the village of Lubuk Kembang Bunga, there is no the concrete bridge. The village road  $\pm 74$  km, that consists of the village main road as long 6 km, the village environment road as long 2 km and the footpath as long 9 km. The village main road as long 6 km is still soil road.

The available education facility in the village of Lubuk Kembang Bunga is Kindergarten, Elementary school, Islam School, and Quran Education Place. The condition of sanitation/toilet in the education facility still can be used but it hasn't been good because it's lack of treatment and dirty. For filling the need of water in the education facility, it's got from the hoist dig well.

### *3.3. The Perspective of The Society Toward The Forest and The Land*

Based on the knowledge of culture and society's adaptation experience with the nature environment, in general the original villagers of forest area of Tesso Nilo have categorization system of land and forest use that are in the environment on four parts, namely: settlement, polak, unirrigated agricultural field/garden, and forest.

The settlement is the concentration center area unity of inhabitant with the settlement that is used as the residence and the place for doing various activities of social life inter family and inter community member. The settlement usually is also become the place of raising and tending the livestock.

The polak is the unity of the land that is usually around the housing and still becomes the part that is one with the village center until the village edge that is usually used for planting the rice, various fruits (coconut, durian, mango, banana, rambutan, etc.) and other young plants. The polak such as mix garden that is the shape of the oldest evolution from the plantation system that has important function for the subsistency economy for the family and the villagers.

The unirrigated agricultural field/garden is one unity of land that is usually in the edge until outside of the settlement that is used for cultivating old plant. It's different with the polak, in the unirrigated agricultural field, the inhabitant usually cultivates in monocultural and carries on cash crop as the main plant that is relied on to produce the income of cash. The rubber plant has been carried for a long time on by the villagers around the forest of Tesso Nilo, since the generation of their grandfather and grandmother, when the first time, the society in this area is just barely enough and no more with the economy of export plant and capitalism in the era of Netherland colonial occupation.

And the forest, is part of nature forest area that is had in communal and become as land reserve for the descent generation until the future. The forest is also usually used the villager for the taking place of construction matter, making matter of small boat for the river transportation and taking place of non-wood forest result such as honey bee, latex of resin, tree for producing milky sap, rattan, large rattan, taboo, certain plant for the medicine, and the place to do go hunting activity.

In the next development, especially since 1980s, the pattern change of inhabitant's settlement has occurred in some places around the forest area of Tesso Nilo such as Lubuk Kembang Bunga. This thing is connected directly with the government policy in giving the concession right to the holder company of right and determination of some area around this region to become the transmigration village. Likewise, the opening of palm oil plantations, industry plant forest and industry development of wood and paper in big scale in this area, systematically trigger the settlement pattern change in all village nook and cranny.

The forest management is done by the forest processing system with the modern scientific principle (scientific forestry). The forest is seen as a unity unit, the production orderliness in order to produce the processing efficiency to get the profit for the country and business agent or to accumulate the capital. With the fact that the forest is not separated from the element of human being such as the existence of local society or custom society that has lived in generation in the area, even before there was a state regulation, so the context of forest area must be placed in the mind pattern of layout and interaction of inter element. Technically, the orderliness of forest limitation becomes important element of optimum forest processing. The limit order of forest area must involve all elements of center and region government, and the local society with the legalization and clear official report so that the conflict won't occur again. The paradigm development of forest processing must be placed in the anthropology pattern and not only through the forest technique processing practice.

Since a long time ago, the problem of forest area is not in the resource in the forest, but more to the problem of tenurial, the place where the forest grows and is being. In the fact, the forest area is certain region (included the land) and the resource inside. The soil becomes important subject that often becomes conflict basic source among the stakeholders, among others inter department and government institution, inter center and region government, inter local society with the government and inter local society with the company of concession/license holder that is given by the government.

The system of land holder in the society professes the social organization system of interior meditations and village chief that has communal characteristic. According to the classification of some type of land holder that is revealed by World Bank, the pattern of authority and property of the land such as it still can be classified into the traditional communal type with the features as followings:

1. the low property concentration – where the sovereignty right is on the community
2. the land processing is not centered and the processing right is on the group members,
3. high economy social generalization
4. low labor productivity
5. low land productivity
6. low labor intensity
7. low capital intensity
8. production is more oriented to the subsistence and
9. structure of service and supporting servicing is still last.

Almost all informants of custom leader that were met, said that all communal lands and TessoNilo forest and all plants that are above it are hit the mark by the property right of communal area from the tribe or the interior meditations that is in the area. There is also the highest authority on this area right, in the society that professes the interior meditations system, the authority is held by the spiritual meanwhile in the villages that profess the village chief system, the authority is held by the headman/the village chief.

The land ownership system in traditional communal like this until now generally still remains to be restrained by the local society. in the case sample, there is sialang tree cut (the kind of tree for the bee to produce the honey) that is done by the side of company of HPH holder, so the area tribe of land owner submits the objection to the company and demands the fine of compensation suitable with the available custom. After through long enough process, and when it can't be solved through the strip of custom law enforcement, the case is even continued until the state court. The result, the court decision grants the demand of custom community, so although the company does the cut in the concession area of its HPH, the company side that does the cut of sialang tree is still levied the fine to pay the compensation to the tribe of area holder on the land.

But, although the confession of area right and communal ownership on the land and the forest is revealed and still held firmly by the local society, there is general view that the arrangement of using and authority on the land and the forest in this area is not apparently relative binding. On a land or forest

that is owned by the tribe or certain spiritual for example, it doesn't mean that only the member of the tribe or other spirituals in that area also can ask and accept the right to open the unirrigated agricultural field, take the wood, build the house, pick the fruits inside and go hunting the animal. The problem is not complex, enough by managing to the spiritual, or the headman, or the village chief or the village elders or authority holder of area right to ask the permission. In the traditional life, it was previous known by the requisite of the custom filling.

With another word, it means that there is ownership pattern on the land and the forest by the spiritual or certain tribe, the characteristic doesn't bind with the pattern of authority and using rule. If it has asked the permission and got the agreement from the authority of area owner or certain tribe leader, so the land and the plant that are above, if it keeps being processed, it will be able to become the right of individual's property. The ownership right on the land that keeps being managed, next, it can be permanent (as the right of individual's property) and can also be inherited to the generation of grandsons in the family. Thus, the concept of communal ownership on the land in the villager around the forest of TessoNilo can become more and more wide as internal factor and push factor that push the expansion rate of inhabitant and occupation escalation of the land or the forest.

#### **4. Conclusion**

Based on the result of study on the field, so some conclusions can be implicated from this research as followings:

1. The big part of geography condition of LubukKembangBunga Village is Plantation, Animal Husbandry, Tourism (TessoNilo National Park), Protected Forest and Water Source.
2. The inhabitant of LubukKembangbunga Village is heterogent with the majority of malay tribe as many 1.642 souls or 47,62%.
3. The inhabitant of LubukKembangbunga Village is classified heterogent, this thing is seen from many existences of the comers that enter to the village. Many comers that live in this village are not separated from the existence of palm oil company that operates in the village area that absorbs many labors from outside of the village.
4. Based on the knowledge of culture and adaptation experience of society with the nature environment, generally the origin villager of TessoNilo forest has the using categorization system of the land and the forest that is in its environment on four parts, namely: settlement, polak, unirrigated agricultural field/garden and forest.
5. The land property system in the society professes social organization system of interior meditations and village chief that has communal characteristic. All lands and forests of TessoNilo and all plants on it are hit by the area right of communal property from the tribe or the interior meditations that is in that area. And there is the highest authority on this area right, in the society that professes interior meditations system, the authority is held by the spiritual meanwhile in the villages those profess the village chief system, the authority is held by the headman/the village chief.

#### **5. Notes**

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## **Right of Litigation Legal Aid Providers Other than Advocates in Pekanbaru Religious Court**

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**Abstract** The main objective of this article is to provide advice to the Supreme Court of the Republic of Indonesia in the framework of drafting the right regulation of litigation Legal Aid Providers other than advocates specifically in Pekanbaru Religious Court. Pekanbaru Religious Court, which has the right to proceed and take part in the trial in assisting the disadvantaged community in the litigation process, only involves an advocate who has been sworn, whereas in Law Number 16 of 2011 concerning Legal Aid of Legal Aid Providers to implement the Government Program actually also involves paralegals, lecturers, and Faculty of Law students. This is confirmed by the Constitutional Court Decision Number 88 / PUU-X / 2012. But in practice only advocates are allowed to proceed. The existence of litigation legal aid providers other than advocates in the Pekanbaru Religious Court needs to be better regulated because the rights of legal aid providers other than advocates are the same as the right of an advocate when handling professional cases in a religious court, namely the right to be appointed as legal counsel based on a special letter of authority, as representative or power of attorney in a lawsuit, as a representative or power of attorney in the lawsuit if filed verbally or in writing, as a prosecutor or defendant as power of attorney or representative in the trial, registered as an advocate/legal aid provider in an accredited legal aid organization, to obtain a case fee, and to accompany clients at the mediation level.

**Keywords: Right, Legal Aid Provider Other than Advocate.**

### **1. Introduction**

The emergence of Law Number 16 of 2011 concerning Legal Aid is expected to protect the constitutional rights of every individual to get legal assistance. Furthermore, it is expected to accommodate the protection of people who are less able to deal with legal cases. This recognition and guarantee of the principle of Equality before the Law is not only limited to political recognition, but also more to prioritize the concrete actions of the state. The state actions should provide guarantees to the public in gaining access to justice in order to fulfill basic human rights (HAM), even their actions must also be taken to ensure the fulfillment of the obligations of this country. In Law No. 16 of 2011 concerning legal assistance, the legal aid providers are not only an advocate, but also paralegals, lecturers and Faculty of Law students.

The existence of paralegals, lecturers, and Faculty of Law students in Legal Aid Institutions, non-governmental organizations and legal academics even Law Faculty students in providing legal advice or assistance to the community is still recognized by the Legal Aid Act. The Constitutional Court Panel of Judges chaired by Hamdan Zoelva decided to reject the Advocates' Lawsuits in 2012 so that the Constitutional Court overturned several articles in the Law that recognized its existence. The refusal is stated in the decision number 88 / PUU-X / 2012 stating that the claim is refused.

In the view of advocates who sued, lecturers, students of Law Faculty, NGOs, and mass organizations were not law enforcers and were not entitled to provide legal assistance. The opinion was countered by the Constitutional Court's judges who argued that the articles that were sued had set clear boundaries and directions regarding legal assistance, legal aid providers, legal aid standards, and advocate codes of conduct that did not contradict the 1945 Constitution. The judges argued that paralegals, lecturers and Law Faculty students could provide legal assistance. While the advocate's obligation to provide legal assistance free of charge is not limited, not reduced and not eliminated by the Act.

The results of the initial observations of the authors from 2016 to 2017 in Pekanbaru Religious Court reveal that only lawyers who have been sworn have the right to proceed and take part in the trial in assisting the underprivileged in the Pekanbaru Religion Court. This contradicts with Law No. 16 of 2011 concerning Legal Aid for Legal Aid Providers to implement the government program which clearly states that not only advocates who can take part in such activity, but also paralegals, lecturers, and Faculty of Law students. This is confirmed by the Constitutional Court Decision Number 88 / PUU-X / 2012. In practice, however, only advocates are allowed to proceed.

## **2. Research Method**

### *2.1. Type of Research*

This type of research is sociological legal research, carried out by an empirical approach by examining the formulation of the problem as well as providing an overview and analysis of the implementation of the rights of legal aid providers other than advocates.

### *2.2. Research Location*

This research was conducted in the Pekanbaru Religious Court. The authors' consideration in making choices about this location was related to the phenomenon, namely the tendency of the rights of legal aid providers not to be fulfilled in the Pekanbaru Religious Court and the absence of socialization of these rights.

### *2.3. Population and Sample*

The populations involved in this study are: Chairman of Legal Aid Institute of Faculty of Law Unilak, Head of Legal Services Division of Kanwilcumham Riau, and Post Officers Legal Services of Pekanbaru Religious Court. All populations are used as samples.

## **3. Discussion**

### *3.1. Right of Litigation Legal Aid Provider Other than Advocates in Pekanbaru Religious Court*

With the enactment of Law Number 18 of 2003 concerning advocates, the advocates who practice in the Religious Courts have the same authority as advocates who practice in other court areas. The difference is only about the type of case under the authority of the judiciary itself. The authority to deal with civil cases for people who are Muslim is one of the authorities of the religious court. Therefore, advocates who proceed in religious courts do not act as legal counsel but as special authorities, because they only deal with civil rather than criminal matters. In order to be able to proceed in the Religious Court, an advocate/legal aid provider other than an advocate must fulfill the normative requirements/have rights, as follows:

1. Must have a special letter of authority;
2. Appointed as a representative or power of attorney in the claim;
3. Appointed as a representative or power of attorney in the claim if filed verbally or in writing.
4. Appointed as a prosecutor or defendant as power or representative in the trial
5. Has been registered as an advocate / legal aid provider in an accredited legal aid organization.
6. Appointed by letter of appointment of legal aid providers by an accredited legal aid agency
7. Makes a statement of willingness to provide free assistance
8. Makes a statement to be present at the first trial.

All of the above requirements must be attached to the filing of a lawsuit or application at the Pekanbaru Religious Court<sup>3</sup>.

Furthermore, the roles of legal aid providers other than advocates in the Religious Courts are as follows:

1. Accelerating the settlement of administrative cases, both divorce and divorce requests for the smooth trial in court.
2. Helping to bring the parties in court in accordance with the trial schedule.

3. Providing an understanding of the law relating to the sitting of the case and its position, to the parties in submitting an application or claim or accepting a religious court decision.

One of the Legal Aid Providers other than advocates is Paralegals who are currently playing a strategic and important function in the legal empowerment movement in the community. Paralegals function as intermediaries or bridges of justice seekers. Paralegal intermediaries play an important role in the defense of the rights and interests of the community, since legal aid organizations are the main access to providing legal assistance to the poor. Paralegal's strategic role is needed in the field of protecting the rights of people who are dealing with the law both through litigation and non-litigation. Legal aid organizations have very few human resources to fight for the rights of the people who are dealing with the law, to conduct litigation activities for those who do not have the news of the oath since they will be expelled by the panel of judges even though there is a law number 16 of 2011 concerning legal assistance that allows paralegals to proceed in court. This is strengthened by the Permenkumham mechanism number 1 of 2018 regarding paralegals in the provision of legal assistance.<sup>3</sup>

Legal aid is not merely pro bono publico work, but is an obligation of the advocate (duty or obligation). Poor people have the right to obtain a defense from advocates or public defenders who work for legal aid organizations. As an acknowledgment of individual rights (individual right), the principle of equality for the law is guaranteed in the Indonesian legal system. This equation knows no exceptions.<sup>3</sup>

Litigation legal aid providers other than advocates in the Pekanbaru religious court have the same rights as professional advocates who are on trial in the court, namely:

- a. Obtain a letter of authority from the client in this case the community from low income and register the letter to the cleric of the Pekanbaru Religious Court. In 2017 only lawyers who had an advocate sign card and an oath minutes that could register a power of attorney in Pekanbaru Religious Court. Legal aid providers other than advocates could not do it. But in 2018 it can be done with the addition of several letters namely Designated by letter of appointment of legal aid providers by an accredited legal aid agency, Making a statement of willingness to provide free assistance, and making a statement to be present at the first trial.
- b. Accompany in the mediation process if all parties are present at the first trial, Mediation in the Pekanbaru Religious Court has the custom that only parties who are allowed to go to lawyers especially those who provide legal assistance other than lawyers cannot enter the mediation room.
- c. Accompany in the first trial, At the Pekanbaru Religious Court, legal aid providers must make a statement of attendance at the first trial and if they are not present, the panel of judges postpones the trial day. If they are not present, the case may not be continued, even though the letter of authority states that the legal aid provider may be replaced or the person comes alone.
- d. Accompany the clients at a follow-up hearing (hearing the suit, answer, replication, verification, conclusion)

In handling the cases in the Pekanbaru Religious Court specifically divorce cases, there are several roles performed by lawyers/legal aid providers other than advocates so that the role of advocates is well realized, namely providing legal services, providing legal advice, defending clients' interests, and representing clients in court:

#### 1) Providing Legal Aid

The role of legal aid providers other than advocates in divorce cases is evident in every case process. Legal aid providers other than advocates make every effort to provide advice to their clients well. In providing its services, the legal aid providers first ask the cause of someone's desire to file a divorce. As a first step, legal aid providers other than advocates also provide an alternative way of reconciliation that is possible so that the problems faced by their clients can get a solution without having to go to court. Although finally the case that happens to the client also go to the court.



## 2) Providing Legal Advice

Providing legal advice to clients that is the responsibility of legal aid providers other than advocates is given since the first time they are confronted with a client. This legal advice is given so that the client has legal awareness of the problems at hand. It could be possible with this initial advice that he could reconcile and revoke his/her plan to file a lawsuit through the court. In such advice, the legal aid providers give the view that the court is the last alternative if forced to go through legal channels.

## 3) Defending client interest

Legal aid providers besides advocates have a role to defend the interests of the community and their clients. Legal aid providers other than advocates are needed when someone faces a legal problem. The role of defending the client's interests in dealing with divorce cases in this case means that defense is absolute to represent clients in court.

Indeed, not all people who file a case in Pekanbaru Religious Court can attend each session. Sometimes part of the session is followed by parties who face the case and sometimes not. In such situation, the role of legal aid providers other than advocates becomes really important. As the bearer of the power of attorney from the client, of course the aid providers play a very important role in every trial procession. They act as a representative in the trial. Formally they act to defend the interests and fight for their clients' rights.<sup>3</sup>

## 4) Right to obtain free case fees

Court fee waiver service is obtained by a legal aid provider other than an advocate after filing a lawsuit or an application stating that the applicant is from a low income family based on the Certificate of Inability (SKTM) attached by the legal aid provider. For legal aid organizations, if the requirements for formal legal assistance are only based on SKTM, while the SKTM is not selective or easily obtained, the right to legal assistance is actually the right of the poor, but it is enjoyed by the rich. As long as there are no clear terms and criteria that determine the criteria for poverty, OBH will find difficulty to determine criteria for poverty. If there is no solution, anyone who submits an application for legal assistance carries SKTM so it is formally considered poor. In order to address this phenomenon, a solution or effort is needed so that the misuse of SKTM as a requirement for recipients of free legal assistance for the poor in Riau Province can be overcome.

## 4. Conclusion

Right of Litigation Legal Aid Providers other than Advocates in Pekanbaru Religious Court is almost the same as the right of an advocate when handling professional cases in a religious court, namely the Right to be appointed as legal counsel based on a special letter of authority, as a representative or power of attorney in a lawsuit, as a representative or proxy in the record of the claim if it is submitted verbally or in writing, and as a prosecutor or defendant as the power of attorney or representative in the trial, the right to be registered as an advocate / legal aid provider in an accredited legal aid organization, the right to obtain a case fee, and the right to accompany the client at the mediation level. However, the reality is different in the Pekanbaru Religious Court. The legal aid providers of litigation other than the advocate do not get these rights.

## 5. Suggestions

1. Pekanbaru Religious Court is expected to facilitate the litigation legal aid providers other than advocates and not to complicate the procedures in filing a case.
2. The Supreme Court of the Republic of Indonesia is expected to make the Regulation in the form of a Supreme Court Regulation concerning the Rights of Legal Aid Providers Other Than Advocates in the Religious Courts so that there is uniformity.

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