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Analysis and Design of Tourism Information System: A Study of Rote Ndao Indonesia

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***Abstract*—The paper will present to analyze and design a tourism information system, which is based website that functions as a means of tourism information services and for promoting tourism in Indonesia specially Rote Ndao District. This information system has comprehensive information on the public and tourists. Methods of data collection on this study are collecting data through literature studies, interviews, and observations and analyze software requirements set out. There are two types of data, First Data, and secondary data. The collection of primary data used freely conducts interviews or does not use the guideline systematically with relevant parties and makes observations attractions in Rote Ndao District and the Department of Tourism and Culture Rote Ndao District. As for the secondary data for the analysis and design of this is data on tourism from books, journals, results of previous studies, brochures, and browsing the Internet. The result from the design of information systems in the form of web-based tourism is expected to become a medium of information and can promote tourism Rote Ndao.**

Keywords— Analysis; Design; Information System; Tourism

I. INTRODUCTION

A. Background

Indonesia has a vast tourism potential that stretches from Sabang to Merauke. There is diversity of tourism, such as travel history, nature and art, and culture, so that the tourism sector can drive the economy to the people. Currently, Indonesia has 35 provinces. One province is the province of East Nusa Tenggara (NTT). NTT has some districts one of which is the Rote Ndao district.

The development of tourism in Rote Ndao districts can become a commodity economy if managed well for the tourism sector can cultivate others' sectors. However, there are many tourist places scattered in this district not everything can be known by tourists, due to the lack of information tourist places. By leveraging advances in the field of information technology is now growing rapidly, with the website media which can be accessed in real time.

Based on the description of the background, the authors identify the problem is:

a. Lack of information on the tourist a place is there, so the difficulty of the sectional community and tourists looking for information about places in Rote Ndao District.
b. Design the tourism information system in Rote Ndao District.

Problem to be studied is about the design of websites that show the profile Rote *Ndao* District, news, attractions, accommodation, and cultural charm, events, providing data tourism Rote *Ndao* District, providing links to websites related to the Department of Tourism and Culture of Rote *Ndao* District and displays the map location to the tourist area in Rote *Ndao* District.

The purpose of this study was to analyze and design of tourism information systems in *Rote Ndao* District that can display information about the profile of the Department of Tourism and Culture of *Rote Ndao* District, news, attractions, accommodation, agenda, activities and ask questions of tourist sites in *Rote Ndao* District.

The benefit of this research is to give an overview of the design of the system making tourism information that can be used as a medium of information dissemination and promotion that can be accessed by the public and tourists in real-time.

II. LITERATURE AND THEORETICAL REVIEW

A. Literature Review

From the results the authors on various sources of research papers, there are few studies related to the information system of tourism, among others: In the study of Nur Budi Nugraha, Suyoto and Pranowo they present a design for the tour guide system. In the system tourists can get information about the tourist location in the city of Surakarta at the right time when they moved. In addition, from these applications tourists can also find other information such as culinary, hotels and markets [1].

Aniwar, Ma, Jarmuhamet And Miysa discuss design methods to build a database for review geospatial information

system of tourism resources in *China-Kazakhstan*, mainly focused on the design structure of a relational database to review the analysis of the transport network [2]. The experimental results Keng-Pei, Chia-Yu, Po-Cheng and San-yih show that the recommendations made by the system with the Text Mining and Mobile Browsing Tracking better suited for the user in hotel options [3]. Phichayasini, Thara and Jitimon, designing a system with two main processes feature extraction hotels and hotel rating. Where the feature extraction process creates a knowledge base using ontology and approach tourism as an analyzer syntactic parser [4]. Web tourism portal offers a variety of functions such as the integration of vector files, zooming and panning facilities for handling maps, tab information contains information about the location of tourist, hotel, date and time and coordinate information, with options panel, has the facility to select and delete layers, drawing with the history of the study area [5].

In the study Mara, Valentina, Nuno and Paulo, they researching on how to tell how humans exploit natural ecosystems in many ways, coupled with interactive technology mobile, can be used to design interventions that bring awareness and engage people in understanding the benefits of ecosystems and biodiversity biological the underlying to promote ecotourism [6].

B. *Theoretical Basis*

a) System

A system is made up of inputs, processing, output, and feedback or control [7]. According to Deepak, Deepa and Jai A system is simply a group of activities and elements, which have been arranged to achieve a certain objective [8].

b) Information

Information is the meaning that a human assigns to data by the known conventions used in their representation. Data becomes information when evaluated in the specific situation or applied to solving a particular problem [8]. Many authorities agree that information is composed of data. It is elementary to its composition and is always more than one datum, implicit or explicit. This implies that information requires the processing of two or more datum [9].

c) Information System

An information system is a combination of hardware, software and telecommunication systems, which can support business operations to improve the productivity of the business and can help managers make decisions [8]. Information technology, including the Internet-based information system, has an important role in expanding the business. The information system does not only help in making decisions but also help in looking for ways to get more profits [7].

d) Tourism

Tourism is a very complex activity and as such, requires tools that support effective decision-making process in relation to the economic, social and environmental demands [10]. Tourism makes a positive impact on the local economy in general and the development of entrepreneurship, in particular [11]. Tourism promotion is very good for developing countries in their efforts to improve the economic benefits from a tourism increase [12].

e) Tourism Information System

Tourism Information systems are a system that contains both layout information about travel location, distance, and path for the location, information from attractions and Opera about the facilities that are around the tourist attractions, which helps travelers obtain information about tourist attractions [13]. Tourism Information systems are a type of computer technology system based on the data information on tourism, which uses geographic model analysis method. It can provide a variety of spatial information and dynamic tourism, provide decision management for the Department of Tourism Management, and provide services for the community [14]. With the use of Internet technology in the travel and its industry, tourists are thought to play a more significant role in the process of planning and designing products and services related to tourism [15].

f) Unified Model Language

The design of this study, researchers will use the Unified Modeling Language (UML). The UML specification provides a set of element's notation readable by humans, as well as the rules for combining them into various types of diagrams, considering the structural aspects and behavior of the software system under development [16].

III. RESEARCH DESIGN

The system is made by performing the analysis and design phases of the system models in advance to get a classification model. The process flow for the training data can be seen in figure 1 below:

Fig. 1. Block Diagram of System Analysis and Design Models.

IV. ANALYSIS AND DESIGN SYSTEM

A. *Profile Research Areas*

a) Profile of Rote Ndao District

This research area is the Rote Ndao District where it is located in NTT Province which is the furthest south in the Republic of Indonesia. This is based on Law No. 9 of 2002 Rote Ndao an expansion area of Kupang Regency NTT province.

b) Potential Tourism in Rote Ndao District

Regent of Rote Ndao based regulation number 48 in 2015 on tourism villages in Rote Ndao District there are 81 tourism villages. Rote Ndao District has many tourist attractions are very interesting, and they are natural, but their infrastructure facilities and inadequate infrastructure resulting in only a couple of natural attractions chosen to be featured for the tourists visited, among other attractions:

- *Nembrala* Beach is a beach resort.
- *Bo'a* Beach.
- *Mando'o* hill.
- *Oesosole* beach.
- The Dead Sea (*Laut Mati*).
- Tiang Bendera (The flag pole).
- *Batu Termanu*.
- Mouth thousand (Mulut Seribu).

B. *Analysis of Current System*

a) *Weakness Analysis System*

Wetherbe and Vitalari develop a framework to classify problems called PIECES, that this approach is used to classify the problem based on the need to improve the performance of the system (performance), information and data (Information), control costs (economics), control and security systems (control), Infrastructure Efficiency (efficiency) and repair service (service) [17].

Table 1 to Table 6 is a description of the identification of problems at the Department of Tourism and Culture Rote Ndao district with PIECES.

- Performance Analysis

TABLE I. RESULTS OF PERFORMANCE ANALYSIS

No.	Variable	Analysis
1	Throughput	Total Throughput of the old system in the dissemination of information takes a long time and the information generated by the brochure is also limited because the existing space in the brochure or banner is limited.
2	Response time	Submission of information made directly through the website of the Department of Tourism and Culture *Rote Ndao* District. So that the information obtained more quickly and save time and the information was accurate. The community can access real-time.

- Information Analysis

TABLE II. RESULTS OF INFORMATION ANALYSIS

No.	Variable	Analysis
1	Accuracy	Submission information is less accurate. Where the dissemination of information to the brochure, in the delivery of common errors, such as errors in brochures or any change after the brochure disseminated information.
2	Relevan	Less relevant information, because the information is right on target so useless. Or limitations of the existing space in the brochure or banner and spread.
3	Timeline	Submission of information at the Department of punctuality is not maximized. Because it takes time in the making and distribution of brochures, banners or by radio.

- Economic Analysis

TABLE III. RESULTS OF ECONOMIC ANALYSIS

No.	Variable	Analysis
1	Cost	Brochures, banners and radio entailing the excessive cost. At which time the delivery of information is very scheduled and requires a significant operational cost. If an error occurs it is costly to fix.
2	Benefit	As important information must follow the schedule, if the information could not follow the schedule information is not economically viable and does not benefit the Department and tourists.

- Control Analysis

TABLE IV. RESULTS OF CONTROL ANALYSIS

No.	Variable	Analysis
1	Control	If an error occurs or a change in the delivery of information, it is difficult to correct an error if the brochure or banner as an information medium has spread to the recipients of information. Brochures that have been distributed are not all controlled so brochures deployed were sometimes not reaching the recipient. Likewise, information disseminated through the website of the District Government of *Rote Ndao* was not controlled directly by the Department of Tourism and Culture *Rote Ndao*.
2	Access rights	The right of access to the website home page *Rote Ndao* District administration is too limited.

- Efficiency Analysis

TABLE V. RESULTS OF EFFICIENCY ANALYSIS

No.	Variable	Analysis
1	Use of Resources	In Office, production and dissemination of information require different parties and longer periods of time, thus requiring costs and resources big enough.
2	Utilization	Brochures and banners that have been used sometimes could not be used again on the deployment of the following information. If you're experiencing errors brochure or banner should be repaired or remade so it takes a long time and huge costs.
3	Result	The capacity of the information contained in the brochure or banner is very limited.

- Service Analysis

TABLE VI. RESULTS OF SERVICE ANALYSIS

No.	Variable	Analysis
1	Variety of information	Variety of information at the Department so much, so if you want to get a complete information must ask pertinent parts.

No.	Variable	Analysis
2	Procedure	Tourism information services provided on the Department is still less than the maximum. Because to get an update to go through several stages and takes a very long time.

b) Comparison Of The Current System And The Proposed System.

An analysis has been conducted found differences between the current system and the proposed system in this study. Comparison of running the system and the proposed system can be seen in Table 7.

TABLE VII. DIFFERENCES BETWEEN THE CURRENT SYSTEM AND THE PROPOSED SYSTEM

No.	The Current System	The System Proposed
1	Have no sites of tourism information systems	Creating a system that can be used to provide information about tourism in *Rote Ndao* District.
2	Submission of information through the website of the Regional Government of *Rote Ndao* District and use brochures, banners, travel catalogs and mass media as well as social media.	Submission of information made directly through the website of the Department of Tourism and Culture *Rote Ndao* District. So that the information obtained more quickly and save time and the information was accurate. The community can access real-time.

C. Software Analysis

The Software name is SIWATRONDA, the software is planned based website, which was built to assist local governments in providing information about tourism in Rote Ndao, where users will interact with the system through an interface Graphical User Interface (GUI).

a) Product Function

The function of SIWATRONDA will be explained based data access and data processing services:

a. Data Access Services Tourism
- Accessing the service profiles.
- Accessing the service news.
- Accessing the service tourist attraction.
- Accessing the service charm.
- Accessing the service event.
- Accessing the accommodation service.
- Accessing a map service.
- Accessing data bank services.
- Access link services.
- Accessing services comment.

b. Data Processing Tourism
- Admin data processing.
- Profile data processing.
- News data processing.
- Tourist attraction data processing.
- Charm data processing.
- Accommodation data processing.
- Data bank data processing.
- Link data processing.

b) Product functional requirements

a. Use Case Diagram by Admin (Figure 2)

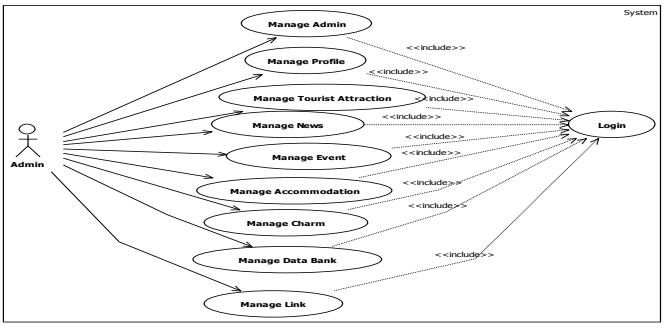

Fig. 2. Use Case Diagram by Admin

b. Use Case Diagrams by Traveler (Figure 3)

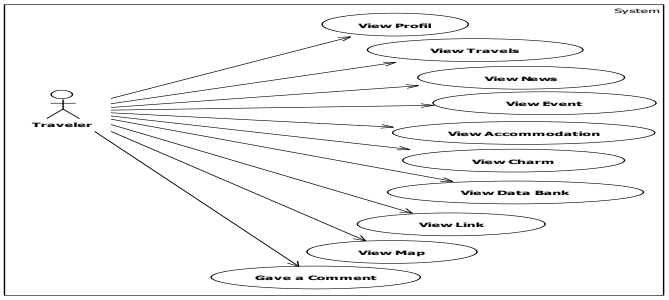

Fig. 3. Use Case Diagrams by Traveler

c. Entity Relationship Diagram (ERD) (Figure 4).

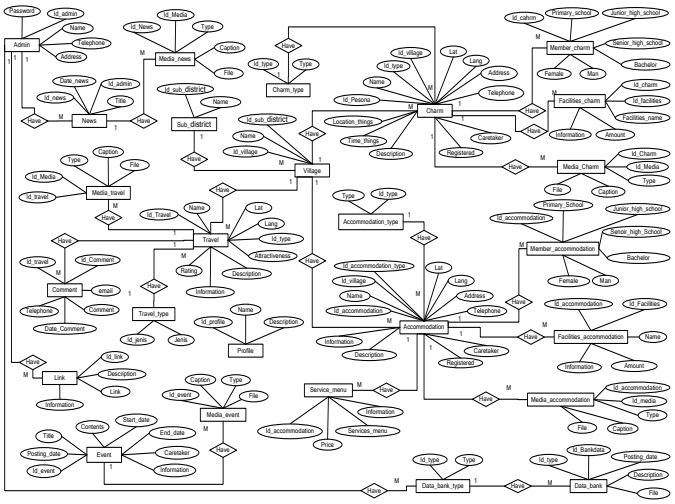

Fig. 4. Entity Relationship Diagram (ERD)

Here is an explanation the relationship between entities in Entity Relationship Diagram above:

- Admin entities and news entities have a relationship from one to many meaning one admin can post more than one news
- Admin entities and link entities have a relationship from one to many meaning one admin can post more than one link
- Admin entities and bank data entities have a relationship from one to many meaning one admin can post more than one bank data
- Bank data type entities and bank data entities have a relationship from one to many meaning one bank data type can have more than one bank data
- Sub-district entities and village entities have relations from one to many means in one sub-district there are more than one village
- Village entities and travel entities have relations from one to many means in one village there are more than one travel
- Travel type entities and travel entities have relations from one to many means in one travel type there are more than one travel
- Travel entities and media travel entities have relations from one to many means in one travel there are more than one media travel
- Travel entities and comment entities have relations from one to many means in one travel there are more than one comment
- Event entities and media event entities have relations from one to many means in one event there are more than one media event
- Travel type entities and travel entities have relations from one to many means in one travel type there are more than one travel.
- Village entities and acommodation entities have relations from one to many means in one village there are more than one acommodation.
- Acommodation type entities and acommodation entities have relations from one to many means in one acommodation type there are more than one acommodation.
- Acommodation entities and media acommodation entities have relations from one to many means in one acommodation there are more than one media acommodation.
- Acommodation entities and facilities acommodation entities have relations from one to many means in one acommodation there are more than one facilities acommodation.
- Acommodation entities and member acommodation entities have relations from one to many means in one acommodation there are more than one member acommodation.
- Village entities and charm entities have relations from one to many means in one village there are more than one charm.
- Charm type entities and charm entities have relations from one to many means in one charm type there are more than one charm.
- Charm entities and media charm entities have relations from one to many means in one charm there are more than one media charm.
- Charm entities and facilities charm entities have relations from one to many means in one charm there are more than one facilities charm.
- Charm entities and member charm entities have relations from one to many means in one charm there are more than one member charm.

c) Software Design

- The main menu page: travelers.

This page (Figure 5) is the starting point that the user accesses the website of tourism information systems in Rote *Ndao* to get tourism information in Rote *Ndao* District.

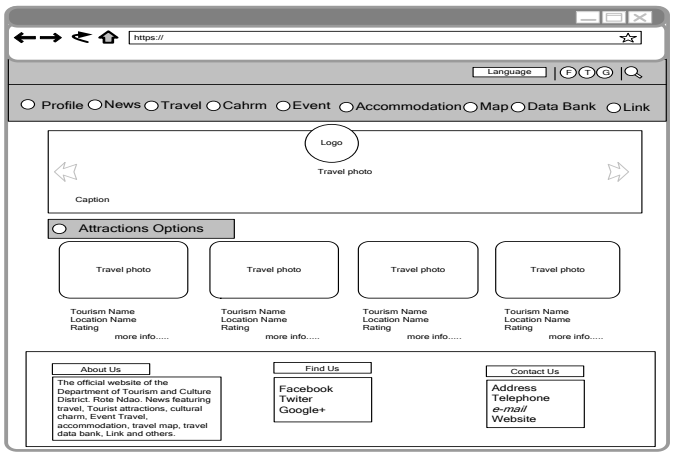

Fig. 5. The main menu page of travelers

- The main menu display: admin.

This page (Figure 6) is used by administrators to manage tourism information in *Rote Ndao* District.

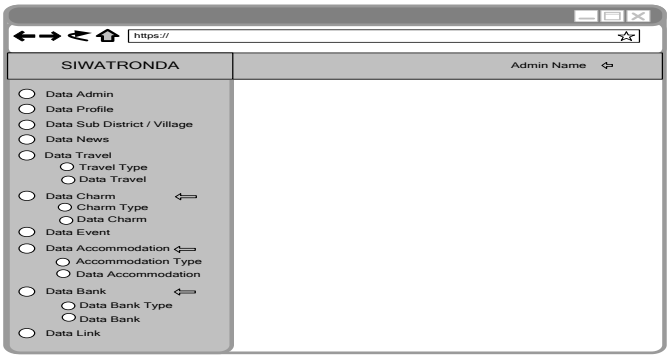

Fig. 6. The main menu display admin.

V. CONCLUSION

Based on research that has been conducted by researchers, then a number of conclusions, including the following:

a. Process Analysis and design of Tourism information systems in *Rote Ndao* District can be built into a system based tourism information website.

b. A system built to help the Department of Tourism and Culture *Rote Ndao* District in conveying information and tourism promotion *Rote Ndao* District.

c. The system is designed is based website, related information such as profile data, news data, the data travel, Data charm, organizer data, the data property, see travel map *Rote Ndao* District, data of tourism as well as links to websites related to the Department of Tourism Culture and *Rote Ndao* District can be easily accessed by the public and tourists.

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