

---

## FORWARDING SALES FORECASTING ANALYSIS OF FREIGHT FORWARDING SERVICES AT PT. GLOBAL DRAGON OCEAN

By

Dewi Rakhmadani<sup>1</sup>, Ade Suryana<sup>2</sup>, Endro Andayani<sup>3</sup>

<sup>1,2,3</sup>Institut Ilmu Sosial dan Manajemen STIAMI Jakarta

Email: [adesuryana@yahoo.com](mailto:adesuryana@yahoo.com)

---

### Article Info

#### Article history:

Received April 24, 2023

Revised April 23, 2023

Accepted May 27, 2023

---

#### Keywords:

Sales Forecasting,  
Autoregression, Exponential  
Smoothing

---

### ABSTRACT

This study aims to find out how to forecast and predict the number of sales of freight forwarding services at PT Samudera Naga Global. This research was conducted using autoregression and exponential smoothing methods. The author conducts research on companies engaged in the transportation of goods that manage all or part of the activities related to the delivery and receipt of goods through transportation routes. The results of the research were carried out using two methods, namely autoregression and exponential smoothing by comparing the smallest error rate, indicating the best and most appropriate forecasting method for PT Samudera Naga Global's sales forecasting, namely the autoregression method with a MAD value of \$127,428.55, MSE of \$22,985.627,066.65.

*This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.*



---

### Corresponding Author:

Ade Suryana

Institut Ilmu Sosial dan Manajemen STIAMI Jakarta

Email: [adesuryana@yahoo.com](mailto:adesuryana@yahoo.com)

---

## 1. INTRODUCTION

The company is an organization founded by a person or a group of business entities whose activities are to produce products both in the form of goods and services to meet human needs. There are three types of companies, namely trading, service and manufacturing companies. The company's main activity is to make sales, because sales are the company's main source of income. Basically every company has the same goal, namely to obtain maximum profit. Along with the era of globalization that makes the business world develop dynamically, the company's competition, especially similar companies will be increasingly stringent. To maintain the survival of the company and generate large profits, management must manage and handle its resources properly.

According to Much Nurachmad, the definition of a company is any form of business that is a legal entity or not, owned by an individual, owned by an association, or owned by a legal entity, both privately owned and state owned, which employs workers by paying them wages or other forms of compensation. As is the case with the definition of a company as stated in Law No. 13 of 2003 Article 1 Paragraph 6, namely every form of business that is a legal entity or not, owned by an individual, owned by an association or owned by a legal entity, both privately owned and state owned, which employs workers or laborers by paying wages or other forms of compensation. Social enterprises and other businesses that have administrators and employ other people by paying wages or other forms of compensation.

One of the forms of the company is a service company, namely a company that produces intangible goods and has the aim of obtaining profits or profit for the company. One of the service companies is a service company in the transportation sector, namely a business sector that provides services for the transportation or movement of goods and/or people with certain distances and modes used. One example is a forwarder service company.

Freight Forwarder is a company that has the main role of carrying out all activities related to freight forwarding, namely the activity of transporting goods or commodities from ports or terminals to importers. Assigned to represent exporters, importers, shippers, or consignees for all shipments of goods, from transportation, delivery,

even transportation arrangements that are safer, more efficient, and more economical. So forwarders are not just limited to moving goods, but act as experts in the logistics network. Like managing documentation formality procedures required by the existence of government regulations from export countries, transit countries and import countries. And in accordance with the scope of its business, freight forwarders also complete documents related to Letters of Credit, Certificates of Receipt, Bills of Lading, Sea Waybills, Air Waybills, House Bills of Lading, Delivery Orders, and so on. Not only that, freight forwarders also settle costs incurred as a result of transportation activities, handling cargo at ports or warehouses, managing documentation and also covering insurance liabilities that are generally required by the owner of the goods. (Capt. R.P. Suyono, 2005:39-41)

Forecasting is defined as a tool for carrying out effective and efficient planning. Because forecasting can provide guidelines in terms of planning, formulating policies, setting sales targets, setting the basis for preparing the budget, in developing the company or in helping the company achieve its goals in the future. Forecasting is also expected to provide input or information that can be accounted for in decision making for companies to minimize errors when making decisions. Errors in decision making or policies can generally have a major impact on the performance or development of the company itself. In daily management practice, a leader or manager often faces cases of choosing a decision, even though it is simple, but the inaccuracy of the choice can be fatal to a company, institution or institution. Therefore, companies must have systematic and measurable guidelines in taking steps, decisions or formulating policies to minimize errors. In a broader scope, sales forecasting can also help predict the level of economic growth, because the forecasting results for the sale of freight forwarding services can be linked to the national economy. This is because the freight forwarding company is a company that is directly related to one of the components of GDP (Gross Domestic Product), which is one of the indices of economic growth, namely exports and imports.

Uncertainty is one of the things that will be minimized in this sales forecasting process. Coupled with the phenomenon of the COVID-19 pandemic which has had a major impact on the freight forwarding service industry. Which in outline provides a greater challenge for companies to set strategies in sales. Because companies in the logistics sector have an important role where this sector is considered to have good potential during the COVID-19 pandemic. With the COVID-19 pandemic, people have a habit of shopping online. This has also inspired companies in the field of freight forwarding services to start focusing on using digital media (IT). In addition to making it easier, in the long run it is also more economical in terms of operations. Technology also plays an important role in the logistics sector, for this reason the role of the government in providing support is very important. Through a series of policies, especially to ensure that the distribution of goods/logistics transport can survive or even maintain continuity so that services to the public both during/after the COVID-19 pandemic are not hampered.

One way is to make a forecast so that it is close to reality by choosing the forecast method that is most suitable for the company's conditions. Therefore, in forecasting, accuracy is needed in choosing the forecasting method, and of course it must also be adjusted to the data and conditions of the company itself. Causal forecasting is one of the most superior and accurate methods compared to the judgmental method and the time-series method because the causal forecasting method has analytical procedures that use or base on a number of economic variables that have the characteristics of economic relations that influence or interdependence between events or processes. past, present, and future economics. Autoregression and autocorrelation methods are the methods that will be used in this study. Both of these methods are grouped as regression methods which are part of the causal forecast method. These autoregression and autocorrelation methods are usually referred to as the regression method combined with the time-series method.

PT. Samudera Naga Global is one of the business entities engaged in the field export import shipping services that have head offices in Jakarta and branch offices in several regions in Indonesia such as Surabaya, Makassar, Semarang and Bitung. Established since February 2004, for approximately 17 years has been handling the process of shipping goods export import. This company handles the process of import-export activities in shipping services along with the necessary documents, including in various continents of Europe, Australia, Asia and America.

From the background that has been described, this is the reason for the author to conduct research by taking the title "Forecasting Analysis of Sales of Freight Forwarding Services at PT. Ocean Dragon Global" with the formulation of the problem as follows:

1. Can sales forecasting help company leaders in making decisions? 2. Can sales forecasting help plan the company's future plans?
3. What method is most appropriate in calculating sales forecasting of PT. Global Dragon Ocean?.

#### **Research purposes:**

Based on the formulation of the problem above, the objectives to be achieved in this study are:

1. To find out and prove whether sales forecasting can help companies make decisions.
2. To find out and prove whether sales forecasting can help plan the company's future plans.

- 
3. To find out and prove the most appropriate method in calculating sales forecasting of freight services at PT. Global Dragon Ocean.

## 2. LITERATURE REVIEW

### Definition of Business

According to Allan Afuah (2004) Business is an organized individual business activity to generate funds selling goods or services in order to gain profits in meeting the needs of the community and in the industry.

According to Griffin and Ebert (2007: 4) business is an organization that provides goods or services for sale with the intention of making a profit.

According to Sukirno (2010: 20) Business is an activity to gain profit. Everyone or individuals or groups carry out business activities, of course, to seek profit so that their living needs are met. No one does business to make a loss.

According to Hooper (2008: 35) Business is everything and the whole complexity that exists in various fields such as sales (commerce) and industry, basic industry, processing, and manufacturing and networking, distribution, banking, insurance, transportation, and so on which then serve and enter as a whole (which serve and interpenetrate) the business world as a whole.

According to Madura (2010: 2) Business is an entity created to produce goods and services to customers. Every business enters into transactions with people. Those people bear the consequences because of the business. Cross-functional cooperation in business emphasizes the need for managers from different functional areas to maximize profits in achieving common goals.

From the above understanding, the authors can conclude that business is a whole series of activities to carry out investments in existing resources that can be carried out both individually and as a group, to meet daily needs and improve living standards by creating goods or services in order to obtain the desired profit. as big magnitude.

### Operation management

Operations Management according to Jay Heizer and Barry Render (2015: 3) translated by Hendra Kurnia, Ratna Saraswati and David Wijaya is: "Operations Management (operations management-OM) is a series of activities that generate value in the form of goods and services by transforming inputs into outputs."

Quoted from R. and Reid and Nada R. Sanders (2013: 3) said that: "operations management is the business function that plans, organizes, coordinates, and controls the resources needed to produce a company's goods and services." Meaning: "Operations management is the business function that plans, organizes, coordinates, and controls the resources needed to produce the company's goods and services."

The definition of Operations Management according to Aulia Ishak (2010: 2) is: "Operations management as the manager of the transformation system that transforms inputs into goods and services. The inputs to the system are energy, materials, labour, capital and information. From some of the definitions of these experts, it can be said that operations management is a management activity in changing the form of inputs or economic resources (factors of production) consisting of labor, working capital, raw materials, equipment or infrastructure facilities, and methods or systems. optimally into output in the form of goods or services that have added value, as an effort to achieve the goals and objectives of the organization.

### Forecasting(*Forecasting*)

Forecasting is an attempt to see the situation and conditions in the future by estimating the effect of future situations and conditions on future developments (Ginting, 2007).

Forecasting is the use of data to describe future events in determining the desired target, while prediction is the estimation of future targets with a high probability of occurrence and is acceptable. (P. Tampubolon, 2014:41)

Tersine (1994) explains that forecasting is a prediction, projection, or estimation of future uncertainties. In general, forecasting activities are as follows:

1. As an aid in effective and efficient planning.
2. To determine future resource requirements.
3. To make the right decision.

Based on the opinion of experts, it can be said that forecasting is an attempt to predict future events, based on quantitative scientific methods (science and technology) which are carried out systematically, while taking into account qualitative matters (intuition, experience, etc.) other

### Purpose of Plugins

According to Subagyo (2002) the purpose of forecasting is to obtain forecasts that can minimize forecast errors which are usually measured by Mean Square Error (MSE), Mean Forecast Error (MFE), Mean Absolute Deviation (MAD),

and Mean Absolute Percentage Error (MAPE). With the forecast error forecast, company management will get an overview of the state of production in the future and will make it easier for company management to determine policies and decisions to be made by the company.

#### Uses of Plugins

According to Subagyo (2002) the purpose of forecasting is to obtain forecasts that are useful for forecasting when making decisions. A good decision is a decision based on consideration of what will happen when the decision is implemented. If the predictions that we make are not quite right, then forecasting problems are also problems that we always face. (Ginting, 2007).

The uses or benefits of forecasting for companies are as follows:

1. As a tool for planning an effective and efficient.
2. To determine future resource requirements.
3. To make the right decision

#### Types of Plugins

In production activities, forecasting the level of demand for a product is necessary to anticipate changing demand. In general, the types of forecasting according to Jay Heizer and Barry Render (2015: 115):

1. Economic Forecast Planning indicators that are useful for helping organizations to prepare mid-term to long-term forecasting, which explains the business cycle that predicts inflation rates, availability of money, funds needed to build other planning indicators.
2. Technological Forecast Long-term forecasts that pay attention to the level of technological progress that can launch new products.
3. Forecasting Demand (Demand Forecast) Forecasting sales and demand for a company in each period within the time horizon. Sales forecasting that controls production, capacity, and scheduling systems and is an input to its financial, marketing, and human resource planning

#### Plugin Steps

According to (Gaspersz, 2005) there are nine steps that must be considered which are used to ensure the effectiveness and efficiency of the forecasting system as follows:

1. Determine the purpose of forecasting.
2. Select the items to be forecasted.
3. Determine the forecasting time horizon.
4. Choose forecasting models.
5. Obtain the data needed to make forecasting.
6. Validation of the forecasting model.
7. Make forecasts.
8. Implement forecasting results.
9. Monitor the reliability of forecasting results.

(Murahartawaty, 2009), In forecasting or forecasting, the forecasting period is divided into 3, namely:

1. Short-term forecasting, namely forecasts made for the preparation of forecast results with a time period of daily to hourly.
2. Mid-term forecasting, namely forecasting made for the preparation of forecast results with weekly to monthly timeframes.
3. Long-term forecasting, namely forecasts made for the preparation of forecast results with a period of 10 years or several years in the future.

#### The Forecasting Method

According to (Render and Heizer, 2001: 48) there are two types of approaches in forecasting: a.

##### Quantative Method

This method uses various mathematical models that use historical data and or clause variables to predict demand.

##### a) Clause Method

##### (1) Trend Projection

Forecasting method with *trend projection* it matches the line *trend* to a series of historical data points and then projecting that line onto a mid- to long-term forecast. If developing a *linetrend* linear with statistical methods, the appropriate method is the small square method (*Least Square Method*). This approach produces a straight line that minimizes the sum of the squares of the vertical differences of the line for each actual observation.

According to (Djarwanto, 2001: 291) the formula for projection *trend* using the small squares method is as follows:

$$Y = a + bx$$

Information :

Y = Forecast the amount of production.

a = The average value of the production forecast.

b= slope coefficient of the trend line.

x= quarter period.

Looking for value a and b for trend projection using the least squares method:

$$a = \frac{\sum Y}{n}$$

$$b = \frac{\sum XY}{\sum X^2}$$

## (2) Linear Regression Analysis

This method, in addition to using historical values for predictable variables, has many factors that can be considered, for example, when planning a production line, considering the readiness of the workforce, the readiness of good machine conditions. According to (Sumayang, 2003: 43) the formula for linear regression analysis is:

$$Y'' = a + bx$$

Information :

Y'' = estimate

a = *intercept* or the intersection of the regression line with the axis y, that is, with the estimated magnitude of the dependent variable y when there is no effect x

b = slope or angle of inclination of the regression line, which shows the magnitude of the influence of changes x against change y.

x = *variable independent* something that hypothetically influences y

The formula looks up the value a and b for the regression line:

$$a = \frac{\sum y \sum x^2 - \sum x \sum xy}{n(\sum x^2) - (\sum x)^2}$$

$$b = \frac{\sum xy - \sum x \sum y}{n \sum x^2 - (\sum x)^2}$$

## b) Method *Time-Series*

### (1) Single moving average method (*Single Moving Averages*)

(Spyros, 1999) *Moving Averages* (moving average) is a value averaging forecasting method by taking a group of observed values which are then averaged, then using the average as a forecast for the next period. The term moving average is used, because each time new observational data becomes available, a new average is calculated and used for forecasting.

single moving average (*Single Moving Average*) is a forecasting method that is done by taking a group of observation values, finding the average value as a forecast for the coming period. Method *Single Moving Average* has special characteristics, namely:

(a) to determine forecasts for future periods requires historical data for a certain period of time. For example, with 3 months *moving average*, then the forecast for the 5th month is only made after the 4th month is finished/ended. If month *moving average* The 7th month can only be made after the 6th month ends.

(b) The longer the time frame *moving average*, the smoothing effect is increasingly visible in forecasting or generating *moving average* which is getting smoother.

Mathematical equations *Single Moving Average* are as follows:

$$F_{t+1} = \frac{X_1 + X_2 + \dots + X_t}{n}$$

Information :

$F_{t+1}$  = Forecast for period t+1

$X_t$  = real value in period t

n = Number of inner limits *moving average*

### (2) Refining Method *Exponential (Exponential Smoothing)*

In this method, forecasting is done by repeating calculations continuously using the latest data. Each data is weighted, two methods in *exponential smoothing* among them *single exponential smoothing* and *double exponential smoothing* (Supriana, Uci, 2010).

Method *moving average* it is easy to calculate but this method gives the same weight to each data. To overcome this problem, the method is used *single exponential smoothing*. On method *single exponential smoothing* the weight given to the existing data is  $\alpha$ . The symbol  $\alpha$  can be set freely, which reduces *forecast error*. The magnitude of  $\alpha$  is between

0 to 1. Mathematically the magnitude of Forecasting is as follows (Subagyo, 2002):

$$F_t = \alpha \cdot X_t + (1 - \alpha)F_t$$

Information :

$F_{t+1}$  = Forecast for period t+1

$X_t$  = real value in period t

$F_t$  = Forecast value for period t

Thus it can be said that the forecast for the future period is the previous forecast plus  $\alpha$  (*alpha*) multiplied by the previous period's forecast error. In forecasting using the method *single exponential smoothing* (SES), the magnitude of  $\alpha$  (*alpha*) is determined by trial and error until  $\alpha$  is found (*alpha*) which produce forecast error smallest.

#### b. Qualitative Method

Qualitative forecasting is by utilizing important factors such as intuition, personal experience and decision return value systems. There are five qualitative forecasting techniques, namely:

- Jury of executive opinion, this method takes the opinion of a small group of high-level managers, often combined with statistical models and produces estimates of group demand.
- Combined sales force, in this method it combines sales forces from each region and then forecasts as a whole.
- Methodology *Delphi*, this interactive group process allows experts who may live in various places to make forecasts.
- Consumer market surveys, namely by entering from customers or prospective customers without looking at their future purchase plans.

#### Measuring the Accuracy of Forecast Results

The measure of accuracy of forecasting results is a measure of the degree of difference between real sales results and forecasting results. Several methods have been used to show errors caused by a particular forecasting technique. Almost all of these measures use the averaging of several functions of the difference between the actual value and the forecast value. The difference between the actual value and the forecast value is usually referred to as the residual (Arsyad, 1997: 57). The higher the level of difference between the real sales value and the forecast value, the worse the accuracy will be. Good accuracy has a level of difference in the value of real sales with low forecasting results.

The equation for calculating the error value or from each forecasting period is as follows (Subagyo, 2002):

$$e_t = X_t - F_t$$

Information :

$e_t$  = Forecasting error in period t

$X_t$  = real value in period t

$F_t$  = real value in period t

Rata-rata Absolute (Mean Absolute Error)

Mean Absolute Error (MAE) is the absolute average of forecast errors, regardless of the positive or negative sign.

$$MAE = \left( \sum_{t=1}^n |(X_t - F_t)| \right) / n$$

$X_t$  = real value in period t

$F_t$  = forecasting value in period t

$n$  = Number of forecasting periods

Mean Square Error (Mean Square Error)

Mean Square Error (MSE) can be calculated by adding up all the forecasting errors in each period, then squaring it and dividing it by the number of forecasting periods. Mathematically, MSE is formulated as follows (Nasution and Prasetyawan, 2008):

$$MSE = \left( \sum_{i=1}^n (X_t - F_t)^2 \right) / n$$

Information :

$X_t$  = real value in period t

$F_t$  = forecasting value in period t

$n$  = Number of forecasting periods

#### Freight Forwarding

##### Definition of Freight Forwarding.

According to the Decree of the Minister of Transportation No. 10 of 1988 Transportation management services (Freight Forwarding) are businesses aimed at representing the interests of the owner of the goods to take care of all activities necessary for the implementation of the delivery and receipt of goods by land, sea or air transportation which can include activities; Receiving, storing, sorting, packing, marking, measuring, weighing, managing document completion, issuing transport documents, calculating transportation costs, claims, insurance for the delivery of goods and settlement of invoices and other costs related to the delivery of these goods until the receipt goods by those entitled to receive them.

---

### Peran Freight Forwarding

Forwarder is where the owner of the goods will receive advice from the forwarder about everything regarding various aspects of shipping and transporting goods:

1. Procedures for packing or packaging of goods.
2. The destination country for sending goods along with reviewing local regulations.
3. Concerning the best and fastest routes and routes for freight transport.
4. Arrangement of documents and monitoring of goods during the transportation process.

### Parties Involved Freight Forwarder

To carry out daily work the forwarder will involve certain stakeholders so that the work carried out can run smoothly, they are:

1. The owner of the goods.
2. Stevedore or in Indonesia it is called Loading and Unloading Company (PBM).
3. Cargo Surveyor inspects goods at the port.
4. Insurance and Banks in terms of documentation and security of goods and related goods systems.
5. Government bodies and agencies such as: Customs, Ministry of Trade, and Ministry of Transportation.

### Freight Forwarder Activities

Freight Forwarder company activities in export-import intermodal transportation according to Suyono (2003) are:

1. Choose the route for the goods, the appropriate mode of transportation and transportation, then order the loading space.
2. Carry out the receipt of goods, sorting, packing, weighing, measuring dimensions, then storing the goods into the warehouse.
3. Study the letters of credit for goods, regulations of export destination countries, transit countries, import countries and then prepare other necessary documents.
4. Carry out the transportation of goods to sea or air ports, take care of customs clearance, then hand over the goods to the carrier.
5. Pay handling fees and pay freight.
6. Get a bill of lading or airway bill from the carrier.
7. Take care of goods transportation insurance and help submit claims to the insurance in the event of loss or damage to goods.
8. Monitor the journey of goods to the recipient, based on information from the forwarding gene carrier in the transit or destination country.
9. Carry out the receipt of goods from the carrier.
10. Take care of entry permits at Customs and Excise and settle import duties and costs incurred at the port of transit or destination.
11. Carry out the transportation of goods from the port to the goods storage area in the building.
12. Carry out the delivery of goods to the consignee, and carry out the distribution of goods when requested.

### Types of Freight Forwarding Services

Some of the types of goods delivery services offered to clients are:

#### 1. Door to Door Service

Goods delivery services offered by freight forwarder companies to service users, starting from the sender's address to the recipient's address, with the process of picking up the goods (pick up) to delivery to the destination address.

#### 2. Port to Port Service

Shipping services that serve the delivery of goods between ports or warehouses for freight forwarders.

#### 3. Port to Door Services

Port to door services are goods delivery services from the shipping company's warehouse, port or place agreed according to the agreement.

#### 4. Door to Port Services

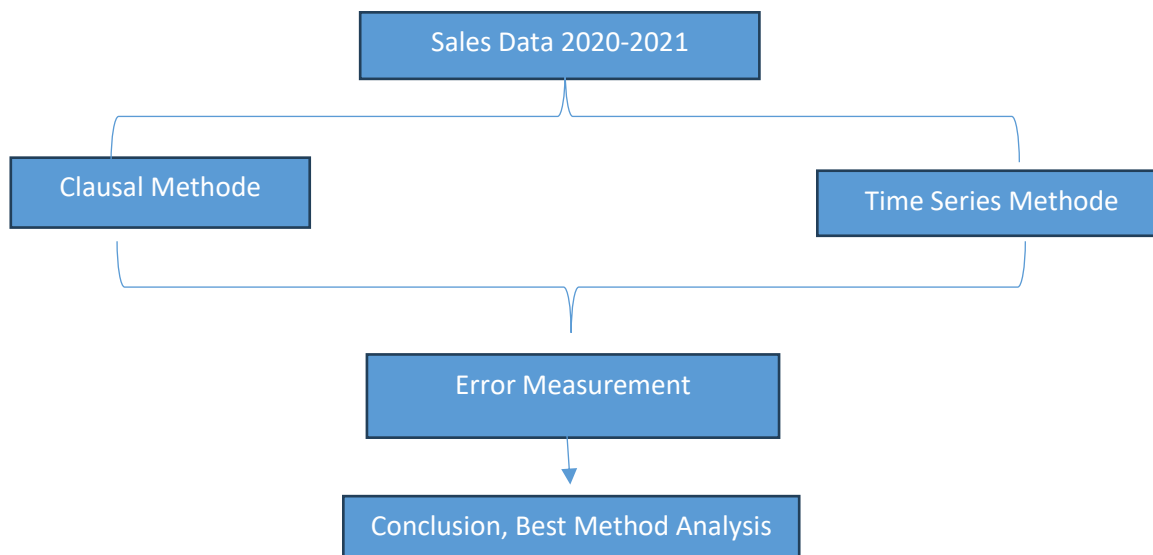
In a door to port service, the freight forwarder company picks up at the location designated by the client and delivers it to the port or warehouse of the recipient of the goods.

### Conceptual framework

Service sales forecasting process *freight forwarding* This is done by comparing the results of forecasting calculations of the two methods, namely the clause method and the method *time-series* by determining the lowest error rate. By using sales data from 2020 to 2021, also by conducting interviews with one of the employees from several divisions at PT Samudera Naga Global. Then analyze and determine the forecasting method that is right and suitable for the company. The benefits of this forecasting for the company, which is expected to help management or company

leaders in making decisions and making *planning* in the future, and can predict sales in the future.

To be more clear, a framework of thought that comes from a book entitled can be described as follows:



**Picture 1. Thinking Framework**

Source: Analysis *Forecasting* and Management Decisions (Soeparno W: 2019) and reprocessed by the author

### 3. RESEARCH METHODOLOGY

#### Approach and Type of Research

The approach and type of research are closely related to the procedures, techniques, tools, and research designs used.

According to Sugiyono (2017), the research method is basically a scientific way to obtain data with specific purposes and uses. Based on this, there are four keywords that need attention, namely the scientific method, data, purpose and usability. Therefore, the researcher chose to use qualitative research methods to determine how to find, collect, process and analyze the research data. The research used is descriptive qualitative research. Descriptive qualitative research is in the form of research using a case study method or approach (Sugiyono, 2017).

In this study, researchers used a descriptive analysis approach, namely research that aims to make a systematic and accurate description of the facts and characteristics of the research population. With this research, the authors want to describe how the forecasting is appropriate and suitable at PT Samudera Naga Global. This research will also look at how important sales forecasting is for companies in helping make decisions and make plans for the future.

The author uses 2 (two) types of data in this study, namely:

1. Qualitative Data, namely data containing company conditions such as company background, company structure, company objectives, company policies and vision and mission as well as data regarding the latest tax regulations.
2. Quantitative data, namely in the form of data or figures that can be calculated as listed in the PT Samudera Naga Global sales report for the period 2020 to 2021.

#### Concept Operations

According to Nani Darmayanti (in Mushlihin 2013) the operational definition is the formulation of the scope and characteristics of a concept which is the subject of discussion and research in scientific work.

Operational includes important things in research that require explanation. Operational is specific, detailed, firm and certain which describes the characteristics of the research variables and things that are considered important.

Limitations in qualitative research are based more on the level of importance and urgency of the problem to be solved. This research is focused on:

1. Precise and suitable forecasting methods at PT Samudera Naga Global.
2. Analysis of forecasting results is the right method for company management in making decisions and making plans for the future.
3. Calculation of freight sales forecast for the next period.

In qualitative research, the focus of the problem is still tentative in the sense that when the researcher is in the



field, the focus may change according to the existing reality. The focus of the problem is not the problem itself. The focus of the problem is a guide or template to determine the real problem. The problem itself can only be formulated when the researcher has gone to the field for research.

#### **Data Collection Techniques**

In collecting data, the author uses 2 data collection techniques, namely: 1. Field Study  
Field studies were carried out by the authors directly at the companies that were used as research subjects, while field research was carried out in the following way:

##### a. Observation or observation techniques

The author collects by direct observation of all activities and activities, especially those related to activities related to this thesis at PT Samudera Naga Global, where the author conducts research.

##### b. Interview Techniques

Interviews were conducted in the form of questions and answers with related parties and those who have authority regarding issues related to the research material. In this case the informants for the researchers were the planning team, the management team, and the financial team in the field. 2. Literature Study and Literature Study

In this technique, the author takes several reading books or literature as a reference for the problem under study to support the primary data that has been obtained from field studies. This secondary data was obtained from books, articles, the internet, and institutional documents related to the theme of this thesis.

#### **Determination of Informants**

In this study, the determination of informants that the authors did was purposive sampling. Purposive sampling is a sampling technique with certain considerations in Sugiyono, (2016: 85).

#### **Data analysis technique**

There are two things that must be considered in accurate and precise forecasting. The first is data collection, the data must be relevant so that the resulting forecast can provide accurate information. Second is the selection of the right technique.

According to Moleong (2017: 280-281) data analysis is the process of organizing and sorting data into patterns, categories, and basic descriptive units so that themes can be found and working hypotheses can be formulated as suggested by the data.

The steps taken by the author in analyzing the data in this study are:

- a. Collect company data such as sales data (sales report) for the period 2020 to 2021.
- b. Calculating and analyzing sales forecasting results to find out the most appropriate and suitable method.
- c. Analyzing the results of interviews to find out and prove whether the results of forecasting sales can help in making decisions and plans for the future.
- d. Making discussions and conclusions from the results of research that has been done.

## **4. RESULTS AND DISCUSSION**

From the results of this study it aims to describe the application of the best sales forecasting method at PT Samudera Naga Global in order to assist management in making decisions for future sales strategies.

The following are the results of research that has been carried out in accordance with the data collection process described above, namely as follows:

1. Can sales forecasting help company leaders in making decisions? Forecasting sales at PT SNG can assist in making decisions because forecasting shows information on how much the forecast error is compared to the actual value, which can be seen from the results of the forecasting MAPE. Where the smaller the error presentation value on MAPE, the more accurate the forecasting results.

2. Can sales forecasting help plan the company's future plans?

Sales forecasting at PT SNG can help plan future company planning because the calculations are seen based on company data for this period and the past period. That way PT SNG can evaluate progress and adjust business processes and adjust the budget for the future.

3. What method is most appropriate in calculating sales forecasting of PT. Global Dragon Ocean?

---

**Table 1. Forecasting with the Autoregression Method**

No (X)	Periode	Y	Y'	MAD	MSE	MAPE
1	Januari 2020	260,203.52	281,786.40	21,582.88	465,820,917.73	0.08
2	Februari 2020	333,081.09	301,400.28	31,680.81	1,003,673,665.32	0.10
3	Maret 2020	613,787.05	321,014.16	292,772.89	85,715,966,896.80	0.48
4	April 2020	455,894.31	340,628.03	115,266.28	13,286,314,606.76	0.25
5	Mei 2020	265,177.30	360,241.91	95,064.61	9,037,279,902.23	0.36
6	Juni 2020	301,879.47	379,855.79	77,976.32	6,080,305,725.84	0.26
7	Juli 2020	353,522.37	399,469.66	45,947.29	2,111,153,570.88	0.13
8	Agustus 2020	385,915.75	419,083.54	33,167.79	1,100,102,113.71	0.09
9	September 2020	155,415.90	438,697.41	283,281.51	80,248,415,808.74	1.82
10	Oktober 2020	329,616.20	458,311.29	128,695.09	16,562,426,040.90	0.39
11	November 2020	688,220.84	477,925.17	210,295.67	44,224,270,719.51	0.31
12	Desember 2020	636,349.14	497,539.04	138,810.10	19,268,243,431.50	0.22
13	Januari 2021	655,899.55	517,152.92	138,746.63	19,250,627,997.92	0.21
14	Februari 2021	484,575.63	536,766.79	52,191.16	2,723,917,566.39	0.11
15	Maret 2021	433,963.90	556,380.67	122,416.77	14,985,865,515.14	0.28
16	April 2021	444,412.65	575,994.55	131,581.90	17,313,795,305.37	0.30
17	Mei 2021	479,699.13	595,608.42	115,909.29	13,434,963,943.38	0.24
18	Juni 2021	425,935.58	615,222.30	189,286.72	35,829,461,589.27	0.44
19	Juli 2021	442,858.85	634,836.17	191,977.32	36,855,292,932.98	0.43
20	Agustus 2021	773,130.23	654,450.05	118,680.18	14,084,985,107.63	0.15
21	September 2021	972,941.90	674,063.93	298,877.97	89,328,043,260.04	0.31
22	Oktober 2021	714,238.86	693,677.80	20,561.06	422,757,097.74	0.03
23	November 2021	876,742.72	713,291.68	163,451.04	26,716,243,043.24	0.19
24	Desember 2021	692,841.57	732,905.55	40,063.98	1,605,122,840.66	0.06
25	Januari 2022		752,519.43			
				<b>127,428.55</b>	<b>22,985,627,066.65</b>	<b>0.30</b>
						<b>30.12%</b>

**Table 2. Forecasting with the Exponential Smoothing Method**

No (X)	Periode	Y	A	1- $\alpha$	MAD	MSE	MAPE
			0.203599113	0.8			
1	Januari 2020	260,203.52	#N/A	#N/A	#N/A	#N/A	#N/A
2	Februari 2020	333,081.09	260,203.52	72877.57	5,311,140,209.10	0.218798	
3	Maret 2020	613,787.05	274779.034	339008	114,926,434,912.26	0.552322	
4	April 2020	455,894.31	344,789.73	111104.6	12,344,228,535.34	0.243707	
5	Mei 2020	265,177.30	368,651.46	103474.2	10,706,901,410.26	0.390207	
6	Juni 2020	301,879.47	348,911.03	47031.56	2,211,967,602.32	0.155796	
7	Juli 2020	353,522.37	340,591.22	12931.15	167,214,741.81	0.036578	
8	Agustus 2020	385,915.75	344,449.81	41465.94	1,719,423,859.79	0.107448	
9	September 2020	155,415.90	354,131.96	198716.1	39,488,070,725.57	1.278608	
10	Oktober 2020	329,616.20	314,948.10	14668.1	215,153,045.26	0.044501	
11	November 2020	688,220.84	319,068.05	369152.8	136,273,783,062.35	0.536387	
12	Desember 2020	636,349.14	395,375.59	240973.5	58,068,250,883.04	0.378681	
13	Januari 2021	655,899.55	445,860.59	210039	44,116,363,011.18	0.32023	
14	Februari 2021	484,575.63	490,229.04	5653.412	31,961,066.44	0.011667	
15	Maret 2021	433,963.90	490,842.40	56878.5	3,235,163,995.76	0.131067	
16	April 2021	444,412.65	481,028.59	36615.94	1,340,726,828.48	0.082392	
17	Mei 2021	479,699.13	475,304.89	4394.239	19,309,337.71	0.00916	
18	Juni 2021	425,935.58	477,910.23	51974.65	2,701,364,254.47	0.122025	
19	Juli 2021	442,858.85	469,048.29	26189.44	685,886,789.89	0.059137	
20	Agustus 2021	773,130.23	465,404.30	307725.9	94,695,247,107.49	0.398026	
21	September 2021	972,941.90	529,732.07	443209.8	196,434,953,133.51	0.455536	
22	Oktober 2021	714,238.86	621,875.76	92363.1	8,530,941,463.96	0.129317	
23	November 2021	876,742.72	642,919.01	233823.7	54,673,527,441.08	0.266696	
24	Desember 2021	692,841.57	692,839.25	2.321912	5.39	3.35E-06	
25	Januari 2022		695,333.33				
				<b>131316.2</b>	<b>34,256,435,366.19</b>	<b>0.257752</b>	<b>25.78%</b>

**Table 3 Forecasting Calculation Results Using Autoregression and Exponential Smoothing Methods**

Metode	MAD	MSE	Ramalan Bulan Januari 2022
Autoregresi	127,428.55	22,985,627,066.65	752,519.43
Exponential Smoothing	131,316.24	34,256,435,366.19	695,333.33

In table .3 the value of the MAD (Mean Absolute Deviation) error rate for the Autoregression method is \$ 127,428.55 and the MSE (Mean Square Error) is \$ 22,985,627,066.65 while in the Exponential Smoothing method the MAD and MSE values are \$ 131,316.24 and \$ 34,256,435,366 ,19. In terms of accuracy, the autoregression method has a lower MAD and MSE than the MAD and MSE resulting from the exponential smoothing method, which means that the autoregression method is better used in forecasting sales of export services in future periods.

Based on the results of interviews and research obtained in the form of determining the best forecasting method at PT SNG. With the existence of sales forecasting using the right method can help the management and planning team as well as the directors in making decisions. Because the results of sales forecasting have been understood and applied because the forecasting shows information on how much the forecasting error is compared to the true value, which can be seen from the results of the forecasting MAPE. Where the smaller the value presentation of errors in MAPE, the more accurate the forecasting results. This can provide convenience in making decisions to determine targets as well as sales budgets in the following year.

Sales forecasting can help companies predict the future of the business, indirectly this can provide an

overview for management regarding the future direction of the business. Thus, management can place itself in the right target market and gain as much profit as possible. And with conditions like that, the company has a great opportunity to fulfill requests from customers, resulting in customer satisfaction. With the sales forecasting can also manage costs as much as possible.

From the calculation of the 2 forecasting methods, namely the Autoregression method and the Exponential Smoothing method, it is known that the calculation results obtained using the Autoregression method are more suitable and more appropriate to be applied to PT SNG in forecasting service sales, because the Autoregression method has a lower error rate compared to the Exponential method. smoothing.

#### 4. CONCLUSION

Based on the analysis and discussion that the writer has done, the writer concludes that:

1. Forecasting helps in making decisions to determine sales targets in the coming period.
2. Forecasting helps in making plans because the data used is accurate.
3. The Autoregression method is a more suitable method to be applied to PT SNG in forecasting service sales in January 2022 because the Autoregression method has a smaller or lower error rate.

#### 5. SUGGESTION

Based on the results of the research conducted there are still limitations, so there are still many things that need to be improved and need to be considered again for further research. As for the suggestions that need to be considered for better research, they are as follows:

1. It is better if in an effort to increase sales as well as profits and minimize losses Sales of this method can be used to estimate future sales, so that companies can make the best decisions to prepare for integrated management.
2. The planning division and management division should carry out sales forecasting on a regular basis so that they can be considered in determining sales targets and getting maximum profits.
3. To facilitate sales forecasting, it is recommended that companies combine qualitative and quantitative forecasting methods so as to strengthen the forecast results.

#### REFERENCES

- [1] Law No. 13 of 2003 Article 1 Paragraph 6
- [2] Afuah, Allan. (2004). *Business Models : A Strategic Management Approach*. New York : Mc Graw Hill.
- [3] Arsyad, Lincoln. (1997). *Economic development*. Third edition, BP STIE YKPN Publisher, Yogyakarta.
- [4] Aulia Isaac. (2010). *Operations Management*, First Edition, Graha Ilmu, Yogyakarta.
- [5] Barry, Render and Jay Heizer. (2001). *Operations Management Principles: Operations Management*. Jakarta : Salemba Empat.
- [6] Capt. R. P. Suyono, M.Mar. (2007). *Shipping Import Export Intermodal Transportation by Sea Edition IV*, Jakarta.
- [7] Capt. R.P. Suyono. (2003). *Shipping Import Export Intermodal Transport by Sea*. Jakarta: PPM.
- [8] Djarwanto. (2001). *Socioeconomic Statistics*, Issue Three, BPFEE Yogyakarta. Gaspersz, V., (2005). *Production Planning and Inventory Control*. Jakarta: Gramedia Ginting, R. (2007). *Production System*. Yogyakarta :GRAHA SCIENCE.
- [9] Griffin, Ricky W & Ebert, Ronald J. (2007). *Business Eighth Edition*. Jakarta: Erlangga.
- [10] Heizer, Jay and Render Barry, (2015), *Operations Management : Sustainability and Supply Chain Management*, 11th edition, Salemba Empat, Jakarta.
- [11] Hooper, D., Coughlan, J., & Mullen, M. R. (2008). *Structural equation modelling: Guidelines for determining model fit*. *Electronic Journal of Business Research Methods*, 6(1), 53–60. Jakarta: Wacana Media.
- [12] John W. Best dan James V. Kahn. (2003). *Research in Education*. New Jersey. Pearson Education Inc.
- [13] Madura, Jeff. (2010). *Financial Institution and Markets : Ninth Edition*. Canada: South-Western Cengage Learning. (Thomson south western)
- [14] Makridakis, Spyros, Steven C Wheelwright, Victor E. McGee. (1999). *Forecasting Methods and Applications*, Volume 1. Jakarta: Binarupa Script.
- [15] Moleong, Lexy J. (2017). *Qualitative Research Methods*, 36th printing, Bandung: PT. Offset Rosdakarya Youth
- [16] Much. Nurachmad. (2012). *All About Indonesian Intellectual Property Rights (Smart Book Understanding Our Intellectual Property Rights)*. Yogyakarta: The Beer Book
- [17] Cheapartawaty. (2009). *Forecasting*. Jakarta: Telkom College of Technology.
- [18] Nasution, A. H., and Prasetyawan, Y. (2008). *Production Planning & Control*. First Edition. Graha Ilmu,



- Yogyakarta Main Library.
- [19] Reid, R. Dan dan Sanders, Nada R., (2013), Operations Management: An Integrated Approach, Fifth Edition, John Wiley and Sons Singapore Pte. Ltd, Inc.
- [20] Subagyo, Pangestu. (2002). Forecasting: Concepts and Applications, 2nd Edition. Yogyakarta: BPFE Yogyakarta.
- [21] Sugiyono. (2016). Quantitative Research Methods, Qualitative and R&D. Bandung: PT Alfabeta. Sugiyono. (2017). Quantitative Research Methods, Qualitative, and R&D. Bandung: Alfabeta, CV Sukirno, Sadono. (2010). Microeconomics Theory Introduction. Jakarta: PT Raja Grafindo Persada Sumayang, Lalu. (2003) Fundamentals of Production and Operations Management, Salemba Empat, Jakarta.
- [22] Supriana, Uci (2010) Forecasting the Gross Regional Domestic Product (GRDP) of Labuhan Batu Regency in the Agricultural Sector in 2011. University of North Sumatra
- [23] Tampubolon, Manahan P. (2014). Operations Management and Supply Chain.
- [24] Tersin, Richard J. (1994). Principles of Inventory and Materials Management. Fourth Edition.
- [25] Prentice Hall, Inc. USA.
- [26] Al-Hafizh, Mushlihin. “*Qualitative Data Research in Research*”, Paper Reference, <http://www.referensimakalah.com>, accessed on 19 March 2013.

THIS PAGE IS INTENTIONALLY LEFT BLANK