DEVELOPMENT OF DISTRIBUTION MANAGEMENT INFORMATION SYSTEM OF THE PRODUCTS IN PT KIMIA FARMA TRADING & DISTRIBUTION BRANCH OFFICES OF TASIKMALAYA

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ABSTRACT

PT Kimia Farma Trading & Distribution branch of Tasikmalaya is a company engaged in the field of Service trade (Ordering products, Product Procurement, demand products and distribution of medicinal products) which are currently experiencing difficulty in SPV Logistics in determining the amount of a product that will be a message to the warehouse of PT Kimia Farma to meet consumer demand for medicinal products (outlet) and the difficulty in determining the route optimisation product delivery medicines with the criteria of distance outlet and many medicinal products – drugs ordered in order to reduce the occurrence of delivery delays. PT Kimia Farma Trading & Distribution branch system that requires Tasikmalaya can arrange the procurement of a product from Warehouses of PT Kimia Farma to PT Kimia Farma Trading & Distribution branch of Tasikmalaya, in order to meet the demand for digudang products in stock distribution of medicinal products to the outlet, and can optimize the delivery of the product to an outlet so that the activity of distributing does not suffer the delay. In the analysis of Procurement Management products, in the planning stages will be used a method of forecasting method i.e (single moving average). While the analysis of the product delivery Routes using TOPSIS method. The conclusion that can be drawn from the results of the design of the application is the application help Logistic SPV in determining the amount of a product that will be a message to the warehouse of PT Kimia Farma to meet consumer demand for medicinal products (outlet) and help SPV Logistics delivery route optimization in determining medicines products with criteria of distance outlet and many medicinal products – drugs ordered but there are some features in applications that are not yet suitable as a product of booking cannot determined based on the procurement. The final result of the design of the form of application of management information system for the distribution of products that can help the chemical Logistic SPV PT. Farma Trading & Distribution branch offices of Tasikmalaya.

Keywords: management, distribution, Drugs, Single Moving Average, TOPSIS

1. INTRODUCTION

PT Kimia Farma Trading & Distribution branch of Tasikmalaya is a company engaged in the field of Service trade (Ordering products, Product Procurement, demand products) and distribution of medicinal products which is located in JL. IR. h. Djuanda No. 90b Tasikmalaya. PT Kimia Farma Trading & Distribution (KFTD) of Tasikmalaya has the purpose of distribution to some destination areas, such as Garut, Tasikmalaya, Ciamis and Pangandaran. And have some great sheds, one of which is located in the city of Bandung area of Pajajaran. the term outlet in this research are hospitals, clinics, and pharmacies.

Based on the data of the request and the delivery outlet recap period December 2016 s/d May 2017 (Appendix D) as much as 72.57% or equal to 391776 tablet medication can not be met because of the number of requests from the outlet every month erratic, and based on the results of the interview with Mr. Hafiz as the SPV logistics in PT Kimia Farma Trading & Distribution Tasikmalaya have 1500 medicinal products (Appendix D), because the process of recording products still use the notes this makes data history not owned well-organized so problematic i.e. SPV Logistics difficulties in determining the amount of the product to be ordered into a large warehouse of PT Kimia Farma in order for stock digudang KFTD medicinal products meet the demand outlets, this causes distribution of medicinal products to the outlet sometimes do not comply with the request of the outlet. The booking process the drug to large warehouses of PT Kimia Farma which runs currently done by random, i.e. with reference to the request data outlet the previous month, this makes the drug sometimes booking amount is inaccurate because the request outlet every month are not always the same.

In addition according to the product delivery outlet recap period may 6, 2017 (Appendix D) as long as this company still finds problems with the existence of delivery delays product from warehouses of PT

Kimia Farma Trading & Distributin Tasikmalaya to outlet. Based on the results of the interview with Mr. Hafiz as the SPV logistics in PT Kimia Farma Trading & Distribution Tasikmalaya causes delay in delivery of the products is a human resources officer at the introduction of the products owned by PT Kimia Farma Trading & Distribution (KFTD) of Tasikmalaya has only 4 officers introduction and features approximately 20 destination outlet product delivery each day so often happens keterlembatan on delivery of the product to an outlet. Therefore to cope with delays in the delivery of the product to an outlet, PT Kimia Farma Trading & Distribution (KFTD) of Tasikmalaya optimal must find a way to reduce the time delay. One way that's done is to find the most optimal routes in the process of delivery of the product at the outlet. Until the time of delivery of the product to an outlet can match the target already given by the SPV logistics.

Based on these problems, we need a system that can manage the procurement activities of the product from Warehouses of PT Kimia Farma to PT Kimia Farma Trading & Distribution branch of Tasikmalaya, in order to meet the demand for digudang products stock distribution products drug outlet, as well as to be able to optimize the delivery of the product to an outlet so that the activity of distributing does not suffer delays.

1.2 Purpose and Objectives

Based on the issues examined, then the point of writing this final task is to build a management information system for PT Kimia Farma Trading & Distribution.

While the desired goal in this research are:

1. Help Logistic SPV in determining the amount of a product that will be a message to the warehouse of PT Kimia Farma to meet consumer demand for medicinal products (outlet).

2. Help Logistic SPV in determining shipping routes optimization products medicines with the outlet distance criteria and many medicinal products – the drugs ordered.

2. The CONTENT of PAPERS

2.2 Compaqny History

PT Kimia Farma Trading Distribution company & engaged in the Trading and distribution Services health equipment and drugs. The company, known as KFTD this, meliliki area services and extensive distribution lines, one of which is located in Bungursari, the town of Tasikmalaya.

Chemical pharmaceutical industry company is Farma first in Indonesia that was established by the Government of the Netherlands East Indies the year 1817. The name of the company was at first is NV Chemicalien Handle Rathkamp & co. based on the wisdom of the company's former top Netherlands nationalization in the early days of independence, in 1958, the Government of the Republic of Indonesia do the melting of a number of companies Pharmacy became the PNF (Pharmaceutical Subsidiaries) Chemistry Bhinneka Farma. Then on 16 August 1971, form a legal entity of the PNF was transformed into a limited liability company, so the name was changed to PT Kimia Farma (Persero).

Before becoming a separate entity, PT Kimia Farma Trading & Distribution (KFTD) was once a division of pharmaceutical Wholesalers (PBF) Kimia Farma Tbk from PT. This Division has the primary task of distributing pharmaceutical products produced by Chemical PT Farma Tbk. to channel-channel spread throughout the archipelago. Armed with the ability to handle penglaman and distribution of Chemical Products PT Farma Tbk. Since the year 1917, on January 4, 2003 Division of pharmaceutical Wholesalers is then developed into a subsidiary by the name of PT Kimia Farma Trading & Distribution, Service-based Trading and distribution.

2.3 The Basic Concept Of Management

Management has been defined in various ways. However, to the intent we understand management as a process or activity that menjelaskna what company leaders in their organization for operational planning, organising, initiating and operating mengandalikan [1].

2.4 Information System Management

A management information system or driver's license is an information system that does all the processing of the transaction is necessary to an organization, also gives support and information processing functions of the management and retrieval of its decision [2].4. The final result is obtained from the perankingan process that is the summation of the matrix multiplication ternormalisasi R with the vector of weights so that obtained the greatest value that was chosen as the best alternative (Ai) as a solution.

Formula for doing normalization are.

2.5 Distribution

The distribution is an attempt to convey goods and services from producer to consumer hands hands in the amount, quality, and a great time with a certain fee. So that this is achieved, a distributor must know the best and fastest way to deliver the goods and services from the hands of the producer to the consumer's hand. [11]

A. functions of distribution channels

The main function of the distribution channels is funneling the goods from the manufacturer to the consumer, then the company in implementing and determining the distribution channels should do a good consideration.

B. Sort – sorts of distribution channels

There are a wide variety of distribution channels of the goods, including:

1. The manufacturer – Consumer
This form of distribution channels is the most short and simple because without the use of intermediaries. Manufacturers can sell goods that it generates through the mail or directly go to home consumers (from House to house). Therefore the channel is called a direct distribution channel.
2. The manufacturer – Retailer – Consumer
Manufacturers only serve a large number of sales to wholesalers only, not to sell to retailers. Purchases by retailers served by wholesalers, and purchases by consumers served retailers only.
3. The manufacturer – Wholesalers – Retailer – Consumer
Distribution channels is widely used by manufacturers, and is named after the traditional distribution channels. Here, the manufacturer only serve a large number of sales to wholesalers only, not to sell to retailers. Purchases by retailers, wholesalers and served the purchase by consumers served retailers only.
4. Manufacturer – Retailer – Consumer – Agent
Here, the manufacturer selects agent as penyalurnya. He runs a large trade activities in the distribution channels. The sales target is mainly addressed to the major retailers.
5. The manufacturer – Agent – Wholesalers – Retailer – Consumer
In the distribution channels, manufacturers often use agents as intermediaries to channel goods to wholesalers who then sell it to small shops [11].

2.6 Forecasting

In these days there is rapid development in techniques and methods of analysis, good economic analysis or analysis of the company's business activities, especially in the field of marketing, production and finance. Developments in the techniques and methods this analysis is closely associated with the development of techniques and methods of forecasting. This is due to the emphasis of intents and purposes from an analysis of the economic and business activities of the company that operates on a review of the situation and the conditions of the current as well as past and see their influence on the situation and conditions in the the days to come. Effort to look at the situation and conditions in the future is an attempt to estimate the influence of the situation and the conditions that apply to the development in the future. Thus it can be said that one of the purposes of economic analysis and the analysis of the business activity of the company is looking at the prospect of the situation and conditions in the future.

In doing the analysis or economic analysis of company's business activities shall be estimated what would happen in the economic sphere or in the corporate world in the future. Activities to predict what will happen in the future, we are familiar with what is called forecasting (forecasting). Any economic policy or the company's policy will not be in spite of efforts to improve the welfare of the public or enhance the success of the company to achieve its goal in the future, where the policy implemented. Therefore it needs to be seen and reviewed the situation and conditions at the time the policy was implemented. Venture to look at and examine the situation and the condition of the activities of forecasting.

2.7 TOPSIS

TOPSIS is one method of decision making multikriteria first introduced by Yoon and Hwang (1981). Using TOPSIS principle that alternative selected should have the distance to the closest tie the ideal solution of positive and negative farthest from the ideal solution from the standpoint of geometric shapes by using Euclidean distance to determine the relative closeness of an alternative with the optimal solution. The positive ideal solution is defined as the sum of the whole value of the best that can be achieved for each attribute, whereas negative-ideal solution consists of the whole of the worst values for every attribute [3].

2.8 Distribution Management Analysis

Analysis of management used in PT Kimia Farma Trading & Distribution analysis of PDCA i.e. Tasikmalaya (Plan, Do, Check, Act). Analysis of PDCA (Plan, Do, Check, Act) is a follow-up of the analysis of a system that is running.



Figure 2.1 PDCA PT. Kimia Farma *Trading & Distribution*

This section will analyze how a process of managing the distribution of medicinal products will be diimpementasikan on distribution management information system in PT Kimia Farma Trading & Distribution Tasikmalaya to be built. Analysis of Distribution Management includes the process of procurement of medicinal products of PT Kimia Farma Trading Center to the company Distribution & and delivery of medicinal products from the company to the outlet. This will be taken in the analysis of one sample/example of a product that will be used as the object to be analyzed, i.e. medicinal products 4mg Salbutamol tablets. 4mg Salbutamol tablets of medicinal products were selected because based on request data, drug Salbutamol tablet 4mg product is a product of the most commonly purchased by consumers (Appendix A). In the analysis of

Management of procurement, in the planning stages will be used a method of forecasting method i.e (single moving average). While the analysis of the product delivery Route with TOPSIS method menggunanakan.

2.9 Analysis Raw Madicine

Procurement is the process of drug activities to provide the drug needs to meet the needs of the company. Procurement process here is to know how many of the drugs that must be conducted in order to meet the needs of demand from consumers.

Analysis of the distribution of drug Procurement Management on management information system of distribution of PT Kimia Farma Trading & Distribution Tasikmalaya Bandung is as follows:

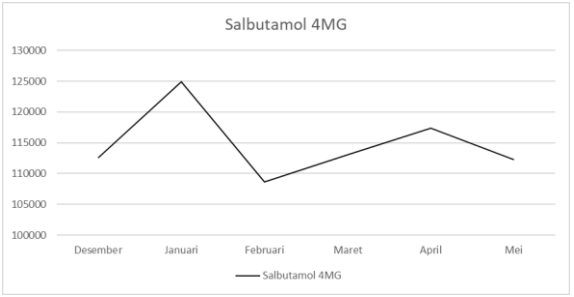
1. Drug Procurement Planning Stage

In the planning phase is done identification of problem, namely how to know number of procurement to be done so that it can meet the needs of demand in the coming period. The data that will be used is a data request Salbutamol 4MG period in December 2016-may 2017. Recap of product demand Salbutamol 4MG December 2016 period-may 2017 that is described in the table

Table 2.1 Recap of the request Salbutamol 4MG

PERIODE (BULAN)	***JENIS Salbutamol 4MG PERMINTAAN***
Desember	*112510 Tablet*
Januari	*124890 Tablet*
Februari	*108650 Tablet*
Maret	*113030 Tablet*
April	*117370 Tablet*
Mei	*112200 Tablet*

Table 2.1 shows the data demand Salbutamol 4MG that will be used as a sample for calculation of demand forecasting Salbutamol 4MG for June 2017. From table 3.1, generate a graph to find out the pattern of sales data from Salbutamol 4MG. It aims to prove that forecasting method used is just right because in accordance with the proper pattern i.e. a horizontal pattern.



Gambar 2.2 Diagram SALBUTAMOL 4MG

2. Stage of implementation of the Procurement Remedies

At this stage of the implementation of procurement is done using an approach method of forecasting (forecasting). In determining the method of forecasting to be used on the system to be built, the first testing done against data requests for any product that was made into a sample using a few different forecasting methods for getting the smallest error rate.

Based on the pattern of the data from the request data type of product Salbutamol 4MG, then forecasting methods to be used in predicting supplies products in PT Kimia Farma Trading & Distribution Tasikmalaya is Single Moving Average method because the movement patterns the data showed fluctuating patterns are irregular. Forecasting is done after knowing the shape of the patterns from the data presented on PT Kimia Farma Trading & Tasikmalaya Distribution has the following stages:

1. Prepare a data request from the period December 2016-may 2017 to be processed as data input.

2. Calculate the value of a forecast on data requests by using the method or Single Moving Average forecasting techniques.

3. Find the values of MSE engineering forecasting to know the smallest results.

4. Compare the smallest value of the calculation result of MSE moving 2 months until moving 5 months.

5. forecasting Results of the techniques of forecasting with the smallest MSE

A Single Moving Average Method.

The value of forecasting can be searched by using a Single method of Moving Average and for moving is moving 2 months to 5 months as a moving comparison.

The first thing to do is determine the moving used and predicted demand for the next period.

1. Calculations for moving 2 monthly

Forecasting results for n = 2 is obtained by inserting the value of Xt 2 months prior to the month would like to note the results of peramalannya. Here are the details of the results of the calculation using the equation (2.3) for determining forecasting in June 2017:

StJuni = XtApril + XtMei/N
= 117370 + 112200/2
= 114785 tablet

2. The calculation for the moving 3 monthly

Forecasting results for n = 3 is obtained by inserting the value of Xt 3 months prior to the month would like to note the results of peramalannya. Here are the details of the results of the calculation using the equation (2.3) for determining forecasting in June 2017:

StJuni = XtMaret + XtApril + XtMei/N
= 113030 + 117370 + 112200/3
= 114200 tablet

3. The calculation for moving 4 monthly
Forecasting results for n = 4 is obtained by inserting the value of Xt 4 months prior to the month would like to note the results of peramalannya. Here are the details of the results of the calculation using the equation (2.3) for determining forecasting in June 2017:
StJuni = XtFebruari + XtMaret + XtApril + XtMei/N
= 108650 + 113030 + 117370 + 112200/4
= 112812.5 tablet
4. The calculation for moving 5 monthly
Forecasting results for n = 5 is obtained by inserting the value of Xt 5 months prior to the month would like to note the results of peramalannya. Here are the details of the results of the calculation using the equation (2.3) for determining forecasting in June 2017:
StJuni = XtJanuari + XtFebruari + XtMaret + XtApril + XtMei/N
= 124890 + 108650 + 113030 + 117370 + 112200/5
= 115228 tablet
Following the results of the forecasting product demand Salbutamol 4MG with moving 2 months until moving 5 months are described in the table

Table 2.2 Result Forecasting Of Single Moving Average SALBUTAMOL 4MG

No	Periode	Permintaan	Moving Average (Bulanan)			
			2	3	4	5
1	Desember	112510 Tablet				
2	Januari	124890 Tablet				
3	Februari	108650 Tablet	118700			
4	Maret	113030 Tablet	116770	115350		
5	April	117370 Tablet	110840	115523	114770	
6	Mei	112200 Tablet	115200	113016	115985	115290
7	**Hasil peramalan bulan Juni**		**114785**	**114200**	**112812,5**	**115228**

After forecasting results obtained for each period moving average of n. The next stages to determine the results of forecasting by choosing the best method. The parameters used by using the criteria of the Mean Square Error (MSE) using the formula in equation (2.12). A method is considered better than other methods if those methods have most small MSE value.
A. calculation of the MSE results forecasting
The calculation using the formula in the MSE equations (2.12) on Chapter 2 before. Forecasting results data obtained from the results of the forecasting on the chart Table 3.2. The following is an example of the calculation of values of MSE.
1. Calculation of the MSE for the value of the moving average period of 2 monthly in February. The month of February was chosen as the beginning of calculations due to forecasting results of the data value of the moving average period of 2 new monthly is available this month.
= (February – March) 2
= (108650 118700-) 2
= (-10050) 2 = 101002500
Salbutamol 4MG MSE results for February 2017 is 101002500, that is obtained from the request in February as much 108650 reduced yield forecasting in February i.e. 118700 and obtained results-10050, after that squared the final results is 101002500.
Doing the same calculation as above examples up to 6th period. After counting up to the MSE-6, total the next step the MSE from 3rd to 6th period. Then the obtained results as below:
MSE = $\frac{(\Sigma|Ft - Y| 2)}{n}$
= 166631000/4
= 41657750
The result of the perjumlahan period of 3 to 6 period i.e. 166631000 then divided 4 i.e. the overall period, then the results obtained by 41657750 is a result of the overall error of a period for moving 2 months.
Do the calculation of the MSE as above of moving 2 months until moving 5 months. Based on the results of the calculation of the MSE for the entire moving 2 months to 5 months to come by the table the results of the calculation of the overall value of MSE on a table here

Table 2.3 The Results Of Calculations MSE

No	Periode	Permintaan	Moving Average (Bulanan)			
			2	3	4	5
1	Desember	112510 Tablet				
2	Januari	124890 Tablet				
3	Februari	108650 Tablet	101002500			
4	Maret	113030 Tablet	13987600	5382400		
5	April	117370 Tablet	42640900	3411409	6760000	
6	Mei	112200 Tablet	9000000	665856	14326225	9548100
Mean Square Error			**41657750**	**3153221.667**	**10543112.5**	**9548100**

Based on the results of the comparison it can be concluded that forecasting the forecasting method with a Single Moving Average 5 monthly that will be used as the basis for forecasting in determining procurement Salbutamol 4MG. Due to the value of the error MSE smallest there is on the method of forecasting the Single Moving Average monthly 5 i.e. 9548100. the most minor error indicates that the accuracy of forecasting results.
4MG Salbutamol demand forecasting results for the next period which is contained in the table above with moving 5 months, then PT Kimia Farma Trading & Distribution Tasikmalaya recommended procurement for SALBUTAMOL 4MG period next June 2017 with a total of 115228 tablets. Obtained from the calculation result:
F7 = (X 2 + X 3 + X 4 + X 5 + X 6)/N
= (124890 + 108650 + 113030 + 117370 + 112200)/5
= 115228 tablet
After the calculation is performed then noted that the estimated demand Salbutamol 4MG in June 2017 that is as much as 115228 tablets, then the SPV Logistics will order Salbutamol product 4MG to the big shed as much as 115228. Following the results of the forecasting product demand Salbutamol 4MG and 9 other products described on the table

Table 2.3 Forecasting The Number Of Product Demand

No	Jenis Obat	Peramalan Jumlah Permintaan Produk
1	Salbutamol 4mg	115228 Tablet
2	Ethambutol 500mg	110943 Tablet
3	Pyrazinamide 500mg	79252 Tablet
4	Isoniazide 100mg	98590 Tablet
5	Simvastatin 20mg	103616 Tablet
6	Isoniazide 300mg	111300 Tablet
7	Clopidogrel 75mg	75294 Tablet
8	Natrium Klorida Widatra	71394 Tablet
9	Dektose 5% Widatra	75340 Tablet
10	Generik Vitamin B Komplek	102994 Tablet

3. The stage of the examination of the procurement Remedies

This stage is the stage of the examination of whether the results of forecasting is already suitable applied according to what is planned at this stage of the Plan. This inspection is carried out by means of checking the results of an evaluation of the results of forecasting with what was planned at the planning stages using the technique of monitoring. Following are the results of the difference in yield forecasting product demand Salbutamol 4MG and 9 other products with a recap of the number of product demand in June 2017 are described in the table.

Table 2.4 Difference in Forecasting the amount of demand for the product and the amount of product demand in June 2017

No	Tanggal	Jenis Obat	Peramalan Jumlah Permintaan Produk	Jumlah Permintaan Produk	Selisih
1	30 Juni 2017	Salbutamol 4mg	115228 Tablet	116720 Tablet	-1492
2	30 Juni 2017	Ethambutol 500mg	110943 Tablet	110100 Tablet	843
3	30 Juni 2017	Pyrazinamide 500mg	79252 Tablet	80490 Tablet	-1238
4	30 Juni 2017	Isoniazide 100mg	98590 Tablet	99150 Tablet	-560
5	30 Juni 2017	Simvastatin 20mg	103616 Tablet	103460 Tablet	156
6	30 Juni 2017	Isoniazide 300mg	111300 Tablet	111890 Tablet	-590
7	30 Juni 2017	Clopidogrel 75mg	75294 Tablet	74960 Tablet	334
8	30 Juni 2017	Natrium Klorida Widatra	71394 Tablet	71900 Tablet	-506
9	30 Juni 2017	Dektose 5% Widatra	75340 Tablet	75320 Tablet	20
10	30 Juni 2017	Generik Vitamin B Komplek	102994 Tablet	103820 Tablet	-826

The Monitoring phase is the phase where the SPV logistics of conducting surveillance and control of the booking process the drug with the aim of avoiding shortages or overstocking method using a Safety Stock. Safety stock or inventory security serves to protect the errors in predicting demand during lead time. Here is a sample calculation using Salbutamol 4MG forecasting method of safety stock:

Description:

The number of forecasting in June 2017 = 115228 tablet

The number of working days in a month = 26 days

Lead time for the procurement of goods to a large warehouse (l) = 2 days

The average booking in one month (d) = 115228/26 = 4431.85 tablet

Standard deviation number of forecasting in June 2017 (sd) = 4432/10 = 443.2 tablet

Standar deviasi dari lead time (sl) = 2/10 = 0.2

Sevice level 95% (Z) = 1.645

Safety Stock = Z x Sdl

$Sdl = \sqrt{(d^2 x\ Sl^2) + (l\ x\ Sd^2)}$

$Sdl = \sqrt{(4431.85^2\ x\ 0.2^2)\ +\ (2\ x\ 443.2^2)}$

$Sdl = \sqrt{(19641294.42\ x\ 0.04) + (2\ x\ 196426.24)}$

$Sdl = \sqrt{(785651.7769) + (392852.48)}$

$Sdl = \sqrt{1178504.257}$

$Sdl = 1085.6$

Safety Stock = 1.645 x 1085.6 = 1785.9 => 1786 tablet

Based on the results of calculation of safety stock which has been performed then the PT Trading Frama & Chemical Distribution Tasikmalaya should provide safety stock Salbutamol 4MG as much as 1786 tablets. Following are the results of safety stock product Salbutamol 4MG and 9 other products for June 2017 are described in the table

Table 2.5 The results of Safety Stock Products in June 2017

No	Jenis Obat	Safety Stock Produk
1	Salbutamol 4mg	1786 Tablet
2	Ethambutol 500mg	1719 Tablet
3	Pyrazinamide 500mg	1228 Tablet
4	Isoniazide 100mg	1528 Tablet
5	Simvastatin 20mg	1606 Tablet
6	Isoniazide 300mg	1725 Tablet
7	Clopidogrel 75mg	1167 Tablet
8	Natrium Klorida Widatra	1106 Tablet
9	Dektose 5% Widatra	1168 Tablet
10	Generik Vitamin B Komplek	1596 Tablet

Part of the warehouse staff must at least provide the products according to the amount of safety stock which has been calculated according to the table above, so hopefully not the case surplus or shortage of the product.

4. Stages of Drug Procurement Actions

This stage is the stage of determining the action to be performed when you are finished with this stage of the plan, do, check and. In addition to the Salbutamol 4MG, there are 9 other products distributed by PT Kimia Frama Trading & Distribution Tasikmalaya. As for forecasting safety stock and the rest of the stock on the 30th of may 2017 can be seen in Table

Table 2.6 Monitoring Of Product Demand

No	Jenis Obat	Safety Stock Produk	Sisa Stock Produk di Gudang	Keterangan
1	Salbutamol 4mg	1786 Tablet	800	Tidak Aman
2	Ethambutol 500mg	1719 Tablet	1980	Aman
3	Pyrazinamide 500mg	1228 Tablet	910	Tidak Aman
4	Isoniazide 100mg	1528 Tablet	120	Tidak Aman
5	Simvastatin 20mg	1606 Tablet	1200	Tidak Aman
6	Isoniazide 300mg	1725 Tablet	2900	Aman
7	Clopidogrel 75mg	1167 Tablet	1750	Aman
8	Natrium Klorida Widatra	1106 Tablet	-850	Tidak Aman
9	Dektose 5% Widatra	1168 Tablet	3195	Aman
10	Generik Vitamin B Komplek	1596 Tablet	800	Tidak Aman

After monitoring the procurement of products above then conducted action against products that are already in stock, if the mains monitoring medications

at PT Kimia Farma Trading & Distribution Tasikmalaya is not secure then the company must do procurement of products, if the stock of medicinal preparation on PT Kimia Farma Trading & Distribution company then secured Tasikmalaya should do the procurement of products. Here's a product procurement action can be seen in the following table.

Table 2.7 Action Of Product Demand

No	Jenis Obat	Safety Stock Produk	Sisa Stock Produk di Gudang	Keterangan
1	Salbutamol 4mg	1786 Tablet	800	Diadakan
2	Ethambutol 500mg	1719 Tablet	1980	Tidak Diadakan
3	Pyrazinamide 500mg	1228 Tablet	910	Diadakan
4	Isoniazide 100mg	1528 Tablet	120	Diadakan
5	Simvastatin 20mg	1606 Tablet	1200	Diadakan
6	Isoniazide 300mg	1725 Tablet	2900	Tidak Diadakan
7	Clopidogrel 75mg	1167 Tablet	1750	Tidak Diadakan
8	Natrium Klorida Widatra	1106 Tablet	-850	Diadakan
9	Dektose 5% Widatra	1168 Tablet	3195	Tidak Diadakan
10	Generik Vitamin B Komplek	1596 Tablet	800	Diadakan

Based on drug procurement actions in table 3.8 if the total remaining amount of safety stock under the stock then PT Kimia Farma Trading & Distribution Tasikmalaya then stated the status held Logistic SPV will then order the product to the big shed, if the total remaining stock above the amount of safety stock then PT Kimia Farma Trading & Distribution Tasikmalaya stated status not held Logistic SPV was not required then order the product to large warehouses as soon as possible, here are a number of products which must be booked on table

Table 2.8 Number Of Products That Must Be Reserved

Jenis Obat	Jumlah Produk Yang Dibutuhkan	Sisa Stock Yang Ada	Safety Stock	Jumlah Produk Yang Harus Dipesan
Salbutamol 4mg	115228 Tablet	800	1786 Tablet	114242 Tablet
Ethambutol 500mg	110943 Tablet	1980	1719 Tablet	111204 Tablet
Pyrazinamide 500mg	79252 Tablet	910	1228 Tablet	78934 Tablet
Isoniazide 100mg	98590 Tablet	120	1528 Tablet	97182 Tablet
Simvastatin 20mg	103616 Tablet	1200	1606 Tablet	103210 Tablet
Isoniazide 300mg	111300 Tablet	2900	1725 Tablet	112475 Tablet
Clopidogrel 75mg	75294 Tablet	1750	1167 Tablet	75877 Tablet
Natrium Klorida Widatra	71394 Tablet	-850	1106 Tablet	69438 Tablet
Dektose 5% Widatra	75340 Tablet	3195	1168 Tablet	77367 Tablet
Generik Vitamin B Komplek	102994 Tablet	800	1596 Tablet	102198 Tablet

Based on the chart above, note the amount of product that must be booked by PT Kimia Farma Trading & Distribution Warehouse to Large Chemical Tasikmalaya Farma.

2.10 Proccess Product Distribution

The following analysis of the stages of planning, implementation, inspection and the actions taken on the process of shipping products.

1. the stage of Planning the distribution of product delivery

In the planning phase is done identification of problems, namely how to know the route the outlet should be undertaken so as to meet the needs of the demand outlets. At this stage carried out an analysis of the Pendistribusin Method as a method to help figure out the route destination outlet that wanted to do the optimization distribution of medicinal products.

Table 2.9 Data Delivery Products may 6, 2017

No	Tanggal	Nama Outlet	Alamat	Produk Dipesan	Jumlah Produk Yang Dikirim	Waktu Kirim	Jarak Kendaraan	Pengguna Pengantar
1	06/May/2017	Rumah Sakit Umum Daerah Kabupaten Ciamis	Jl. Ahmad Dahlan No. 79, Ciamis Kec. Ciamis Kabupaten Ciamis	120 Tablet	120 Tablet	120 Menit	Motor Bebek	agus
2	06/May/2017	Rsud Kota Banjar Kota Tasikmalaya	Jl. R.H. Lanang Kunjaeh Pataruman Kota Tasikmalaya	90 Tablet	90 Tablet	120 Menit	Motor Bebek	ian
3	06/May/2017	Rumah Sakit Umum Daerah Dr. Soekardjo	Jl. Mr. Ir. Dr. Soekarno No. 2 Tasikmalaya Jawa Barat	200 Tablet	200 Tablet	240 Menit	Mobil Engkel Box	bos
4	06/May/2017	Rsud Pameungpeuk Cipanjang Jl. Raya Cipanjang No.234	Cipanjang Kec. Pameungpeuk Kab. Tasikmalaya	80 Tablet	80 Tablet	120 Menit	Motor Bebek	ian
5	06/May/2017	Rsud Kota Banjar Jl. Raya Langkaplancar - Cijulang	Jl. Raya Kota Banjar Jawa Barat Tasikmalaya	1200 Tablet	1200 Tablet	240 Menit	Mobil Engkel Box	bos

To see the data delivery product on May 6, 2017 more information can be seen in (Appendix D)

Table 2.10 Analysis of Packaging in PT Kimia Farma Trading & Distribution Tasikmalaya

Ukuran Kemasan	Jenis Kemasan	Jumlah/Kemasan	Berat Kemasan	Volume (pxlxt)
Kemasan Kecil	Duss Kecil	5000 Tablet / Batch	12 Kg	35x26x21
Kemasan Besar	Duss Besar	10000 Tablet / Batch	20 Kg	60x40x30

In determining the method of distribution to be used on systems that are built will use the aid decision support system by using TOPSIS method. The reason using TOPSIS method in the journal since according to d. l. Kurniasih, "decision support system for the selection of Laptop with TOPSIS Method," 2301-9425, vol. III, no. 1, pp. 8-9, 2013 TOPSIS method (Technique for Order Performance by Similiarity to Ideal Solution) will produce a recommendation route for shipping the product to an outlet – outlet, expected more regularly than before. Stages of determining routes can be seen in Figure

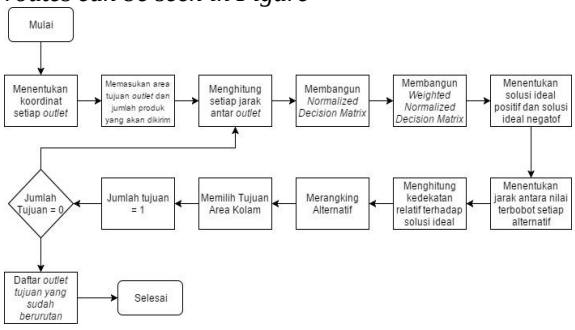


Figure 2.3 Stages Of Topsis Method

In the application of TOPSIS method in the take the case of the distribution of product delivery on 06 may 2017. On that date there are several delivery conducted officer introduction, there are 4 officers who do shipping with each delivery routes are different – different. Application of TOPSIS on take one of the officer's introduction to determine the fastest shipping route.

2. Stage of implementation of Product Distribution

After the planning process is the distribution of the product, after that continued with the implementation stage. The execution of the delivery is the pursuit of action so that all the planning is already done and in the rencakan in the table 3.2 can manifest very well and as expected. Implementation process product delivery are as follows:

1. Determine the coordinates of each area of the outlet

Coordinates of each area of the outlet of the help of google Maps/earth. The trick with the groundbreaking area outlet will note its own coordinate then mismatch existing gps coordinates on a gadget or mobile after ascertained the location already accurately then make a note of its own coordinate for later entered into the system. The description can be seen in Figure



Figure 2.4 Take The Outlet Area Coordinates

The image was obtained from the outlet area HOSPITALS create a vest in the example and the rest in the recapitulation which is marked by a red pin is located at latitude-longitude coordinates 7.334699 and 108.359319. Enter the data destination area outlet will be targeted and the number of products to be delivered or distributed. The criteria of the determination of the route of delivery this is the closest distance, and number of products most. For example will do the selection of routes for the delivery of the product outlet area with data requests can be seen in Table

Table 2.11 The criteria of selection of outlet

No	Nama Outlet	Alamat	Kriteria		
			Latitude	Longitude	Jumlah Permintaan Produk
1	Rumah Sakit Umum Daerah Kelas C KAB. Ciamis	Jl. Rumah Sakit No.76, Ciamis, Kec. Ciamis, Kabupaten Ciamis	-7.334699	108.359319	12520
2	Dinas Kesehatan Kota Tasikmalaya	Jl. IR. H. Juanda Komplek Perkantoran Kota Tasikmalaya	-7.316736	108.198976	5500
3	Rumah Sakit Umum Daerah DR. Soekardjo	Jl. RSU No.33, Empangsari, Tawang, Tasikmalaya, Jawa Barat	-7.332355	108.225286	25850
4	UPT Puskesmas Cisayong Jl. Raya Cisayong No.134	Jl. Raya cisayong No. 124 kec. Cisayong Kab. Tasikmalaya	-7.21996	108.185973	910
5	Puskesmas Bojonggambir Jl. Pasikuning - Ciawi	Jl. Ciawi Kec. Bojonggambir Kab. Tasikmalaya	-7.51225	107.975702	20945
6	APOTEK ANNUR	Jl. RSU No. 42	-7.332346	108.2246	23200
7	RS Al-ARIF	Jl. Raya Kawali Kec. Baregbeg Ciamis	-7.296192	108.370028	8750
8	RSU NIRMALA	Jl. Baregbeg Ciamis	-7.410998	108.678651	7500
9	RS PERMATA BUNDA	Jl. Mr. Iwa Kusumasumantri No.1 Ciamis	-7.330921	108.363501	9500
10	APOTEK ASYIFA	Kios Pasar Ciawitali Ds. Purwadadi	-7.448802	108.654556	8220
11	APOTEK AL MUDAWI	Psr. Panawangan Lt. II No.1	-7.117242	108.381749	6880
12	APOTEK ANUGRAH	Kp. Bojong 03/07 Ds. Sukamulya cihaurbeuti	-7.28046	108.203025	5100
13	RSB HARAPAN BUNDA	Jl. Ir. H. Juanda No. 327 Ciamis	-7.327548	108.340844	19400
14	APOTEK FIRDAUS	Jl. Raya Wanaraja No.368 Ds.Wanaraja Kec.Wanaraja Kab.Garut	-7.172666	107.981098	7790
15	APOTEK AA	Jl. Ciledug No.34 RT.01 RW.10 Kel.Regol Kec.Garut Kota Kab.Garut	-7.216515	107.906092	9110
16	APOTEK ABADI JAYA	Jl. Cikuray No.36 Kel.Regol Kec.Garut Kota Kab.Garut	-7.217665	107.904564	4230
17	PUSKESMAS PURBARATU	Kel. Purbaratu, Kec. Purbaratu	-7.333537	108.25646	24800
18	PUSKESMAS KAHURIPAN	Jl. Siliwangi, Kec. Tawang	-7.34818	108.221055	8500
19	RSUD BANJAR	Jl. Rumah Sakit No. 5 Hegarsari Pataruman Banjar	-7.368716	108.543214	3100

3. The stage of supervision of the distribution of Products

After the implementation phase is complete then the next stage is the stage of supervision. On the supervision process product delivery done by SPV. Logistics can be seen the suitability of shipping order status can be seen in table

Table 2.12 Monitoring Of Product Delivery

No	Tanggal	Tujuan Outlet Data Pengiriman	Petugas Pengantar Data Pengiriman	Tujuan Outlet Alternatif Hasil Solusi Ideal	Petugas Pengantar Alternatif Hasil Solusi Ideal	Hasil Alternatif Solusi Ideal	Status
1	06 Mei 2017	Rumah Sakit Umum Daerah Kelas C KAB. Ciamis	Agus	Dinas Kesehatan Kota Tasikmalaya	Ari	0.9586	Tidak Sesuai Rute
2	06 Mei 2017	Dinas Kesehatan Kota Tasikmalaya	Ari	APOTEK ANUGRAH	Ihsan	0.95789	Tidak Sesuai Rute
3	06 Mei 2017	Rumah Sakit Umum Daerah DR. Soekardjo	Nara	UPT Puskesmas Cisayong Jl. Raya Cisayong No.134	Ari	0.95683	Tidak Sesuai Rute
4	06 Mei 2017	UPT Puskesmas Cisayong Jl. Raya Cisayong No.134	Ari	PUSKESMAS KAHURIPAN	Ari	0.95475	Tidak Sesuai Rute
5	06 Mei 2017	Puskesmas Bojonggambir Jl. Pasikuning - Ciawi	Nara	RSUD BANJAR	Ihsan	0.95047	Tidak Sesuai Rute
6	06 Mei 2017	APOTEK ANNUR	Nara	APOTEK ABADI JAYA	Ihsan	0.94082	Tidak Sesuai Rute
7	06 Mei 2017	RS Al-ARIF	Agus	APOTEK AL MUDAWI	Ari	0.89846	Tidak Sesuai Rute
8	06 Mei 2017	RSU NIRMALA	Ari	RS Al-ARIF	Agus	0.89594	Tidak Sesuai Rute
9	06 Mei 2017	RS PERMATA BUNDA	Ihsan	APOTEK ANNUR	Agus	0.89427	Tidak Sesuai Rute
10	06 Mei 2017	APOTEK ASYIFA	Agus	RS PERMATA BUNDA	Ihsan	0.88358	Tidak Sesuai Rute
11	06 Mei 2017	APOTEK AL MUDAWI	Ari	APOTEK FIRDAUS	Agus	0.87597	Tidak Sesuai Rute
12	06 Mei 2017	APOTEK ANUGRAH	Ihsan	APOTEK ANNUR	Nara	0.86948	Tidak Sesuai Rute
13	06 Mei 2017	RSB HARAPAN BUNDA	Nara	Rumah Sakit Umum Daerah DR. Soekardjo	Nara	0.83569	Tidak Sesuai Rute
14	06 Mei 2017	APOTEK FIRDAUS	Agus	Rumah Sakit Umum Daerah Kelas C KAB.	Agus	0.80938	Tidak Sesuai Rute

				Ciamis			
15	06 Mei 2017	APOTEK AA	Ari	APOTEK AA	Ari	0.80394	Sesuai Rute
16	06 Mei 2017	APOTEK ABADI JAYA	Ihsan	RSU NIRMALA	Ari	0.79077	Tidak Sesuai Rute
17	06 Mei 2017	PUSKESMAS PURBARATU	Nara	APOTEK ASYIFA	Agus	0.75695	Tidak Sesuai Rute
18	06 Mei 2017	PUSKESMAS KAHURIPAN	Ari	PUSKESMAS PURBARATU	Nara	0.72326	Tidak Sesuai Rute
19	06 Mei 2017	RSUD BANJAR	Ihsan	RSB HARAPAN BUNDA	Nara	0.60218	Tidak Sesuai Rute
20	06 Mei 2017	APOTEK ANNUR	Agus	Puskesmas Bojonggambir Jl. Pasikuning - Ciawi	Nara	0.02875	Tidak Sesuai Rute

SPV Logistics shipping process to conduct surveillance of products in the following way:

1. Match the order the route delivery with the order of the receipt of the product dioutlet contained on the form that was already on the sign at the time of delivery of the products is carried out by officers of the outlet that accepts the product.

2. Match the data that is signed by the officer in the same outlet with data requests made by officers of the outlet.

3. If no errors are found, from sending the invoice reception then the product will be stored for the needs of the company.

If errors are found, the process urutar product delivery then the officer's introduction will be given notification/message into the system and sanctions in accordance with the provisions of the PT Kimia Farma Trading & Distribution.

4. The distribution of the product the action Stage

After the stage of scrutiny then continued with the stage action. The stage action is the role of the SPV Logistics to direct officers to conform with the objectives of the company, can be seen in table

Table 2.13 Action Stage Distribution Products

No	Tanggal	Awal	Tujuan	Jumlah	Alamat	Jenis Kendaraan	Nama Petugas
1	06 Mei 2017	PT. Kimia Farma	Dinas Kesehatan Kota Tasikmalaya	5500	Jl. IR. H. Juanda Komplek Perkantoran Kota Tasikmalaya	Motor Bebek	Ari
2	06 Mei 2017	PT. Kimia Farma	APOTEK ANUGRAH	5100	Kp. Bojong 03/07 Ds. Sukamulya cihaurbeuti	Motor Bebek	Ihsan
3	06 Mei 2017	PT. Kimia Farma	UPT Puskesmas Cisayong Jl. Raya Cisayong No.134	910	Jl. Raya cisayong No. 124 kec. Cisayong Kab. Tasikmalaya	Motor Bebek	Ari
4	06 Mei 2017	PT. Kimia Farma	PUSKESMAS KAHURIPAN	8500	Jl. Siliwangi, Kec. Tawang	Motor Bebek	Ari
5	06 Mei 2017	PT. Kimia Farma	RSUD BANJAR	3100	Jl. Rumah Sakit No. 5 Hegarsari Pataruman Banjar	Motor Bebek	Ihsan
6	06 Mei 2017	PT. Kimia Farma	APOTEK ABADI JAYA	4230	Jl. Cikuray No.36 Kel.Regol Kec.Garut Kota Kab.Garut	Motor Bebek	Ihsan
7	06 Mei 2017	PT. Kimia Farma	APOTEK AL MUDAWI	6880	Psr. Panawangan Lt. II No.1	Motor Bebek	Ari
8	06 Mei 2017	PT. Kimia Farma	RS Al-ARIF	8750	Jl. Raya Kawali Kec. Baregbeg Ciamis	Motor Bebek	Agus
9	06 Mei 2017	PT. Kimia Farma	APOTEK ANNUR	6400	Jl. RSU No. 43	Motor Bebek	Agus
10	06 Mei 2017	PT. Kimia Farma	RS PERMATA BUNDA	9500	Jl. Mr. Iwa Kusumasumantri No.1 Ciamis	Motor Bebek	Ihsan

In spite of the results in the table above was obtained the ideal solution for effective objectives based on the distance and the number of products that were taken from warehouses of PT Kimia Farma was TASIKMALAYA HEALTH SERVICE outlets. After the CITY HEALTH SERVICE outlets of TASIKMALAYA was chosen as the original purpose. Then do the calculations go back with the rest of the other outlet destination calculated the distance from the warehouses of PT Kimia Farma.

2.8 Data Flow Diagram

Context diagram is a model to explain how data is used globally and is transformed to the process or describe the flow of data into and out of the system. Context diagram on the system can be seen in Figure

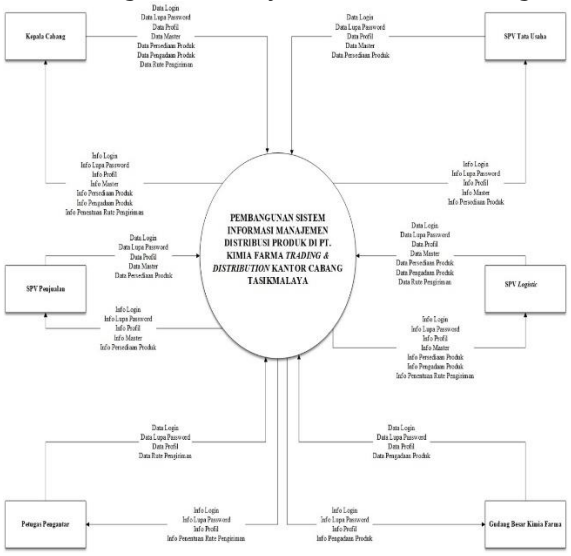


Figure.2.5 Data Flow Diagram

2.9 Scheme Relation

The partnership scheme is a series of relationships between two or more tables in a database system. A series of data bases on the application described in Figure 4.

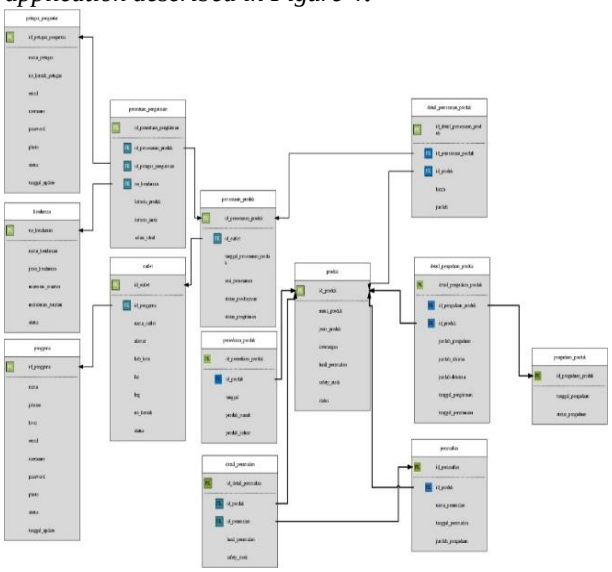


***Figure.2.6** Schema Relation*

2.10 Implementation Interface

Following is the display of the interface of the system will be built:

1. Implementation of the interface of Home

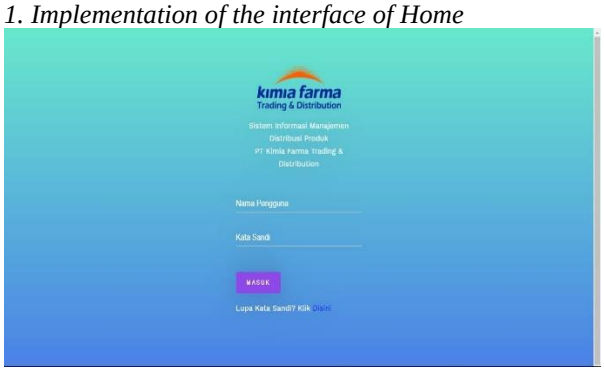


Figure 2.7 Interface Beranda

1. CLOSING

The conclusion that can be drawn from the results of the design of the application is the application help Logistic SPV in determining the amount of a product that will be a message to the warehouse of PT Kimia Farma to meet consumer demand for medicinal products (outlet) and help SPV Logistics delivery route optimization in determining medicines products with criteria of distance outlet and many medicinal products – drugs ordered but there are some features in applications that are not yet suitable as a product of booking cannot determined based on the procurement. The final result of the design of the form of application of management information system for the distribution of products that can help the chemical Logistic SPV PT. Farma Trading & Distribution branch offices of Tasikmalaya.

BIBLIOGRAPHY

[1] T. Sutabri, Sistem Informasi Manajemen, Yogyakarta: ANDI, 2005.

[2] G. B. Davis, Management Information System: Conceptual Foundations, Structure, and Development, Tokyo: McGraw-Hill Kogakusha, 1974. .

[3] D. L. Kurniasih, "Sistem Pendukung Keputusan Pemilihan Laptop dengan Metode TOPSIS," *2301-9425*, vol. III, no. 1, pp. 8-9, 2013.

[4] L. D. B. K. C. D. Jeffery L. Whitten, Sistems Analysis and Design Methods, Tokyo: McGraw-Hill Education, 2004.

[5] J. HM, Analisis dan Desain Sistem Informasi: Pendekatan Terstruktur Teori dan Praktek Aplikasi Bisnis, Yogyakarta: ANDI, 2005.

[6] D. P. K. K. P. M. Sokovic, "Qualiti Improvement Methodologies PDCA cycle, RADAR Matrix, DMAIC and DFSS," *JAMME*, vol. 43, no. 1, pp. 477-478, 2010.

[7] G. B. Davis, Management Information Systems: Conceptual Foundation, Structure, and Development, 2nd ed., vol. II, Tokyo: McGraw-Hill Kogakusha, 1974.

[8] Sunarfrihantono, Bimo. (2002). PHP Dan MySQL Untuk Web. Yogyakarta: Andi Yogyakarta.

[9] Simarmata, Janner. (2010). Rekayasa Perangkat Lunak.Yogyakarta : Andi

[10] Kristanto, Andri, 2008, Perancangan Sistem Informasi dan Aplikasinya, edisi revisi, Yogyakarta: Gava Media.

[11] D. M.Sc, Ilmu Pengetahuan Sosial Ekonomi, Erlangga.

[12] S. Assauri, Teknik & Metoda Peramalan penerapannya dalam ekonomi dan dunia usaha, Fakultas Ekonomi Universitas Indonesia.

[13] M. Ekananda, Analisis Data Time Series, Bekasi: Mitrawacanamedia, 2014.

[14] M. R, Manajemen Logistik Terintegrasi, Jakarta: PPM Manajemen, 2015.