PROCUREMENT OF MANAGEMENT INFORMATION SYSTEM CV. RADJA SALE

Genta Mahendra[1], Rani Susanto[2]

[1,2] Teknik Informatika – Universitas Komputer Indonesia
Jl. Dipatiukur No. 112-116, Jl. Dago No. 160-162, Bandung, Jawa Barat 40132
E-mail : gentamahendra1994@gmail.com[1], rani.susanto@email.unikom.ac.id[2]

ABSTRACT

CV. Radja Sale is one of the companies engaged in the manufacture of various banana sale. To do production, it takes several raw materials consisting of raw materials that can be stored for a long time and raw materials that cannot be stored for long. The problems contained in the CV. Radja Sale is not yet able to control the amount of raw materials ordered to suppliers, so sometimes companies experience shortages of raw materials which result in production processes being hampered, or experiencing excess raw materials that make raw materials that cannot be stored for a long time to expire. Based on the problems that have been described, then built a Procurement Management Information System at CV. Radja Sale. Forecasting method used in this study is Single Exponential Smoothing with Mean Square Error, the method of controlling raw material inventory in the warehouse using Safety Stock. The goal is to assist the Procurement Manager in planning the procurement of raw materials to suppliers, as well as avoiding excess and lack of raw material stocks in the warehouse. Based on the test results, it can be concluded that this system is enough to assist the Procurement Manager in planning the procurement of raw materials to suppliers and helps the warehouse manager monitor the inventory of raw materials in the warehouse, but is still not fully working well.

Keyword: Management System Information, single exponential smoothing, Safety Stock, Information System.

1. INTRODUCTION

CV. Radja Sale is one of the companies engaged in the manufacture of various banana sale which was established on February 2, 2010, and is located on Jl. R.E. Martadinata No. 47 Kota Tasikmalaya. CV. Radja Sale processes raw materials into products that are ready to be distributed to customers. To produce banana sale products, raw materials needed by the company include bananas, rice flour, tapioca flour, sugar paste, fried oil, plastic, and packaging labels. Raw materials needed by CV. Radja Sale is supplied by suppliers, by way of the company ordering in advance to the supplier.

CV. Radja Sale itself has a total of 7 suppliers for raw materials with details of 1 supplier for bananas, 1 supplier of rice flour, 1 supplier of tapioca flour, 1 supplier for sugar paste, 1 supplier of cooking oil, 1 supplier for plastic, and 1 supplier of packaging labels, which where these raw materials are sent routinely every month, except for the banana raw materials that are sent every week.

There are two types of raw materials, namely raw materials that can be stored for a long time and raw materials that cannot be stored for long. Raw materials that can be stored for a long time include rice flour, tapioca flour, sugar paste, cooking oil, plastic packaging, and labels that are ordered every 25-30 of the month. Meanwhile, raw materials that cannot be stored for long time are banana raw materials which are ordered on Friday or Saturday every week. Each raw material does not experience a decrease in quality within a certain period, except for banana raw materials which only last for a period of approximately one week.

In the process of procuring raw materials in the CV. Radja Sale, the warehouse manager will check the amount of raw material used and report the amount of raw material remaining in the warehouse to the procurement manager, then the procurement manager will order the needed raw materials to the supplier by estimating the amount of raw materials to be ordered based on the product sales report period the previous month from the sales manager to be used as a reference in the next period of sales, then the raw materials that have been ordered will be stored in the warehouse.

Based on raw material stock data, there is a shortage or excess stock of raw materials in the warehouse, for example based on raw material stock data for the period 2018 (Appendix-E), there is a large excess of raw material stock in bananas in January and February, and experiencing shortages in March, tapioca flour experienced a shortage in May, and rice flour lacked in June. That is because all this time the procurement manager has placed an order based on the previous month's sales report for the next estimated amount of raw materials needed for production needs. Resulting in the occurrence of excess or lack of substantial raw materials. If there is excess stock, then the raw materials that cannot be stored for a long time can become stale, while having

a shortage of raw materials will cause a delay in production so that this can cause a decline in company profits.

Therefore, with the discovery of these problems, a Management Information System system is needed that can help the company in determining the amount of raw materials to be ordered, and can monitor the availability of raw materials in the warehouse, so that the company is easier in determining the procurement of raw materials . The aim is to be able to assist procurement managers in determining the amount of raw material procurement to suppliers to meet production needs based on management sales reports and assist warehouse managers in monitoring raw materials in order to properly control the availability of raw materials in warehouses.

2. CONTENT OF RESEARCH

2.1 Information System

Information system is a system within an organization that meets the needs of daily transaction processing, supports operations, is managerial and strategic activities of an organization and provides certain external parties with the necessary reports [1].

2.2 Management Information System

A management information system or SIM is an information system that in addition to doing all the transaction processing that is necessary for an organization, it also provides information support and processing management and decision making functions [2].

Organizations always need systems to collect, process, store, look back, and distribute information. SIM is a computer-based information processing system designed for the operations, management and decision functions of an organization. Management information system is described as a pyramid which can be seen in Figure 1.

Figure 1. Pyramid Of Management System Information

Where the basic layer consists of information for transaction processing, status explanation, the next layer consists of information sources in support of day-to-day management operations, the third layer consists of information system resources to assist tactical planning and decision making for management control, and the layer The top consists of information data to support planning and policy formulation by top level management.

2.3 PDCA

The PDCA cycle is a systematic method for continuous process improvement based on the principle that we need to understand the situation or process before improving it.

The main process, the actual outcome of an action compared to the target or initial goal, then corrective steps are taken if the distance difference is too large. The repetitive nature and continuous improvement are characteristic of the PDCA cycle (Plan, Do, Check, Act), this is called Deming Circle, named after W.E Deming. Another variation of PDCA is PDSA (Plan, Do, Study, Act) [3]. Following is an explanation of each PDCA cycle activity.

a. Plan
   Is the stage to set targets or goals to be achieved in the improvement of the process or problem to be solved, then determine the method to be used to achieve the targets or targets that have been set.
b. Do
   It is the implementation stage or all that has been planned at the plan stage, including carrying out the process, as well as carrying out data collection (data collection) which will then be used for the check and act stage.
c. Check
   It is an examination and review phase and learns the results of the implementation in the do phase. Make a comparison between the actual results that have been achieved with the targets set and also the accuracy of the specified schedule.
d. Action
   Is a stage to take action as necessary to the results of the check stage.

2.4 *Single Exponential Smoothing*

The Single Exponential Smoothing method is used in conditions where the weight of the data in one period is different from the data in the previous period and forms the Exponential function. This method greatly reduces the problem of data deviation because there is no need to save historical data. The effect of the size of the α is opposite to the effect of entering the number of observations. This method always follows every trend in the actual data because what it can do is no more than set future predictions with a percentage of the final error. Determining α near optimal requires several attempts [4].

2.5 *Mean Square Error* (MSE)

Mean Squared Error (MSE) is the average of forecasting errors squared and can be seen in the equation (2.11).

$$MSE = \frac{\sum(Xt-Ft)^2}{n} \qquad (2.11)$$

Information

X_t = Actual data for period t

F_t = Forecast data from the model used in period t

n = Lots of forecast data

2.7 *Safety Stock*

Safety Stock is a safety stock so that the stock of goods in the warehouse can be maintained properly so that there is no shortage or excess. The time difference between when ordering until the item arrives is known as the Lead Time. The grace period is influenced by the availability of goods ordered and the distance of location between the customer and the supplier of the goods. The uncertain grace period results in a shortage of goods, for example due to the use of goods that are greater than previously estimated, therefore a safety stock is needed [6].

The safety stock formula can be calculated with the equation (2.13).

$SS = Average\ usage\ of\ the\ previous\ period\ x\ LT$ (2.13)

Keterangan :

SS = *Safety Stock*

LT = *Lead Time* (Product procurement from suppliers to the company)

2.8 Problem Analysis

Problem analysis is an assumption of the problem that will be described. In accordance with the results of information gathering and interviews with Mr. Pipin as the warehouse manager, there were several problems found, among others:

1. The difficulty of warehouse managers in determining the amount of raw materials that must be ordered to suppliers to meet production needs because of uncertainty ordering products from customers.
2. The difficulty of warehouse managers in monitoring raw materials so that the availability of raw materials in the warehouse is less well controlled.

2.9 Analysis Of Procurement Management Information System CV. Radja Sale

The research method will be carried out for the management process of procurement of raw materials for production by analyzing the PDCA (Plan, Do, Check, and Act) and forecasting using the Single Exponential Smoothing (SES) method. Where this method is used for forecasting raw materials for the coming period, using product sales history for 5 months in the year 2018. Next is the PDCA analysis of the Raw Material Procurement Management Information System CV. Radja Sale can be seen in Figure 2.

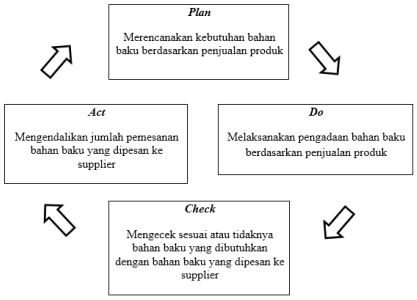

Figure 2. Analysis of PDCA

A. Anaysis Of Planning Raw Material Requirements

In this stage, planning raw material needs is based on production needs. Forecasting period is done every month, and the data used for forecasting are data on product sales in the previous 5 months namely in January - May 2018, raw material monitoring data in June 2018, and supplier data. The product that will be used as an example for forecasting is the sale of banana rolls from January 2018 to May 2018. Meanwhile for the planning of ordering raw materials, the distribution of types of raw materials is carried out.:

1. Raw materials that can not be stored long consisting of bananas, which will be ordered every Friday or Saturday every week.
2. Raw materials that can be stored for a long time consist of rice flour, tapioca flour, sugar paste, cooking oil, labels, and plastics that are ordered between the 25th - 30th of every month.

Next, the following is supplier data and sales data for sale of banana rolls that will be used as examples in the planning of procurement of CV raw materials. Radja Sale can be seen in Table 1 and Table 2.

Table 1. Supplier Data

No	Nama Supplier	Jenis	Satuan	Waktu Pengiriman	Packaging
1	PT. Sungai Budi (Rose Brand)	Tepung Beras	Kg	2-3 HARI	50kg
2	PT. Sungai Budi (Rose Brand)	Tepung Tapioka	Kg	2-3 HARI	25kg, 50kg
3	PT. Sungai Budi (Rose Brand)	Minyak Goreng	L	2-3 HARI	2L
4	PD. Sumber Makmur	Pasta Gula	Kg	2-3 HARI	5kg
5	UD. Dinamis	Pisang	Kg	2-3 HARI	10kg
6	PD. Agung	Label	Pack	2-3 HARI	100pcs
7	PD. Agung	Plastik	Pack	2-3 HARI	100pcs

Next is the data on the sale of banana rolls in the January to June 2018 periods.

Table 2. Product Sales Table Sale Banana Rolls

Bulan	Jumlah (Bungkus /500gr)
Januari	2053
Februari	1869
Maret	2043
April	2108
Mei	2084
Juni	2004

B. Analysis Of Raw Material Procurement

Furthermore, at this stage is forecasting the sale of banana rolls using Single Exponential Smoothing forecasting method to determine the number of sales in the next period to be used as a reference based on sales data for sale of banana rolls in table 1. The calculations use the following formula

$$F_{t+1} = F_t + \left(\frac{Xt}{N} - \frac{Xt-n}{N} \right) \qquad (2.1)$$

1. Forecast Calculation

Forecasting values can be found by using the equation Ft + 1 = (1 / N) Xt + (1 - 1 / N) Ft while for alpha (α) to be used is a value range between zero to one that is alpha = 0.1, 0.2, 0.3 , 0.4, 0.5, 0.6, 0.7, 0.8 and 0.9 for comparison.

The first thing to do to calculate the Single Exponential Smoothing forecasting method is to determine the value of the constant alpha = 0.1 and predict sales for the 2nd period. The values for forecasting are taken from the sales data of banana rolls sale products in Table 3.1, then distribute these values to the formula Ft + 1 = (1 / N) Xt + (1 - 1 / N) Ft, we will get a calculation like below this :

Example calculation of forecasting sale of banana rolls for α = 0.1:

The sale of rolled banana products in January (Xt) = 2053 and the results of the January calculation (Ft) = 2053, because January cannot be calculated so the calculation results are obtained from the January product sales. So an example calculation is obtained as below:

Ffebruari = (0.1 * 2053) + (1 – 0.1)* 2053
= 2053 Bungkus

The calculation for alpha = 0.2 from March and the following month is done in the same manner in accordance with the February and March sales calculations. Forecast the same way as above until alpha = 0.9.

After all the calculation of the sale of banana rolls from February to June, the calculation results are obtained for alpha = 0.1 to alpha = 0.9.

After all calculations from α = 0.1 to α = 0.9 are performed, the next step can determine which forecast results can be used, by calculating the smallest error value of the forecast. Because the smaller the error value, the forecast forecasting will not miss. Calculation of error values using MSE (Mean Squared Error) with the formula MSE= $\Sigma|Xt-St|\text{^}2/n$

2. The smallest MSE error calculation

The example of calculating MSE sale banana rolls for α = 0.1 is as follows:

MSE = (Xfebruari – Ffebruari) ^2
= (1869 – 2053)^2
= 33856

MSE results for February are 33856, which is obtained from the results of 1869 February data minus 2053 forecast results for February results are squared and the final result is 33856.

Perform the same calculation as the example above until June. After calculating the MSE until June, the next step is to add the MSE from January to June. Then the results obtained as below:

MSE = (Σ | Ft - Y | 2) / n
= 42731.63455 / 6
= 7121.939092

The results of the addition of period 1 to period 6 is 42731.63455 then divided by 6, which is the whole period, then the results obtained 7121.939092 are the results of the overall error of the period for alpha = 0.1.

Perform MSE calculations as above from α = 0.1 to α = 0.9. based on the results of MSE calculations for all α = 0.1 to α = 0.9.

Following are the results of forecasting and MSE calculations can be seen in table 2.

Table 3. Calculation of Forecasting and MSE

Periode	Jumlah	Hasil Peramalan								
		α = 0.1	α = 0.2	α = 0.3	α = 0.4	α = 0.5	α = 0.6	α = 0.7	α = 0.8	α = 0.9
January	2053	-	-	-	-	-	-	-	-	-
February	1869	33856	33856	33856	33856	33856	33856	33856	33856	33856
March	2043	70.56	718.24	2043.04	4044.96	6724	10080.16	14113.44	18823.84	24211.36
April	2108	5264.9536	7471.8736	9339.2896	10641.9856	11236	11058.6256	10128.4096	8545.1536	6489.9136
May	2084	1706.020416	2038.7031	1905.147904	1436.106816	841	326.308096	38.340864	30.382144	254.211136
June	2004	1834.100537	1925.31399	2444.946473	3278.982454	4290.25	5296.113295	6106.234678	6577.599286	6657.646111
Hasil Peramalan		2042.54	2039.10	2038.61	2038.36	2036.75	2033.11	2027.44	2020.22	2012.16
MSE		7121.939092	7668.35512	8264.737329	8876.339145	9491.208333	10102.86783	10707.07086	11305.49584	11911.52181

Based on the results of the comparison of α in the calculation of Forecast error using MSE, it can be concluded that forecasting error sale of banana rolls, α with a value of 0.1 produces the smallest error. From table 3.2 the MSE value of α = 0.1 is 7121.939092, then the forecast for the number of sales of banana rolls in July 2018 is 2043 packs.

Furthermore, for forecasting calculations for each product sale at the implementation stage (Do) is done in the same way. The entire forecast of banana sale products for July can be seen in Table 3.

Tabel 4. Results of Forecasting Sales of All Banana Sale Products in June 2018

No	Nama Produk	Hasil Peramalan (Bungkus)	Pembulatan Peramalan (Bungkus)	Error Terkecil (MSE)
1.	Sale Pisang Jari	1820.48	1821	(α)=(0,1)= 19909.53989
2.	Sale Pisang Oval	589.96	590	(α)=(0,2)= 762.2962714
3.	Sale Pisang Golodog	515.99	516	(α)=(0,1)= 457.0154114
4.	Sale Pisang Lidah	2060.20	2061	(α)=(0,2)= 11142.67004
5.	Sale Pisang Gulung	2042.54	2043	(α)=(0,1)= 7121.939092
Jumlah (Bungkus)			**7031**	

Based on the results of the comparison of alpha alia (a) it can be concluded that the results of the smallest (a) value that will be used as the basis for forecasting in determining the amount of sale of banana sale products.

Here are the Bills of Material from the whole banana sale product CV. Radja Sale for every 1 pack (500gram).

Table 5. Bill Of Material Banana Sale Products CV. Radja Sale

No	Nama Bahan Baku	Satuan	Produk					Jumlah
			Sale Pisang Jari	Sale Pisang Oval	Sale Pisang Golodog	Sale Pisang Lidah	Sale Pisang Gulung	
1.	Pisang	Gr	300	350	350	250	250	1500
2.	Tepung Beras	Gr	150	100	100	150	150	650
3.	Tepung Tapioka	Gr	50	50	50	100	100	350
4.	Pasta Gula	Gr	20	20	20	20	20	100
5.	Minyak Goreng	Ml	750	500	500	1000	500	3250
6.	Label	Pcs	1	1	1	1	1	5
7.	Plastik	Pcs	1	1	1	1	1	5

Furthermore, the application of the safety stock method is the process of calculating the safe limit of inventory that must be available in the warehouse for the next period and the reorder point. The safety stock formula can be calculated with the equation;

SS = Number of product sales for the previous period * LT / Number of days of the month

Information :

SS = Safety Stock

LT = Lead Time (procurement of Raw Materials from suppliers to the company)

The following is an example of calculation of the safety stock of banana raw materials:

Noted that :

Total raw material orders for June = 2010

Number of days in June = 30 days

Lead Time on procurement to suppliers = 3 days

Settlement :

$$safety\ stock = \frac{(2010)}{30} \text{x} 3 = 201$$

Based on the calculation of safety stock above, the CV. Radja Sale must provide a safety stock of 201 pcs of banana rolls. In order to obtain the results for all raw materials that must be ordered as follows.

Table 6. Safety Material Stock Table for July 2018

No	Nama Bahan Baku	Satuan	Sisa *Stock* di Gudang	*Safety Stock*	Status
1.	Pisang	Kg	0	201	Tidak Aman
2.	Tepung Beras	Kg	70	170	Tidak Aman
3.	Tepung Tapioka	Kg	60	85	Tidak Aman
4.	Pasta Gula	Kg	60	34	Aman
5.	Minyak Goreng	L	0	70	Tidak Aman
6.	Label	Pcs	1200	850	Aman
7.	Plastik	Pcs	1200	850	Aman

Based on safety stock monitoring, there are remaining raw material stocks that have unsafe status, so the company must determine the total number of raw material orders with the equation: Order amount = (forecasting + remaining stock) - safety stock.

The number of raw material orders can be seen in Table 7.

Table 7. Amount of Raw Materials Needed

No	Nama Bahan Baku	Hasil Peramalan	Sisa *Stock* di Gudang	*Safety Stock*	Jumlah
1.	Pisang (Kg)	1959.4	92	201	1850.4
2.	Tepung Beras (Kg)	999.35	0	170	829.35
3.	Tepung Tapioka (Kg)	556.75	70	85	541.75
4.	Pasta Gula (Kg)	140.62	60	34	166.62
5.	Minyak Goreng (Kg)	5001.25	60	70	4991.25
6.	Label (Kg)	7031	1200	850	7381
7.	Plastik (Kg)	7031	1200	850	7381

Next is a breakdown of the amount of raw materials needed from each of the banana sale products CV. Radja Sale.

Table 8. Details of Raw Material Requirements

No	Nama Bahan Baku	Satuan	Produk					Jumlah Bahan Baku	Total Jumlah Bahan Baku Dengan Safety Stock
			Sale Pisang Jari	Sale Pisang Oval	Sale Pisang Golodog	Sale Pisang Lidah	Sale Pisang Gulung		
1.	Pisang	Kg	546.3	206.5	180.6	515.25	510.75	1959.4	1850.4
2.	Tepung Beras	Kg	273.15	59	51.6	309.15	306.45	999.35	829.35
3.	Tepung Tapioka	Kg	91.050	29.5	25.8	206.1	204.3	556.75	541.75
4.	Pasta Gula	Kg	36.420	11.8	10.32	41.22	40.86	140.62	166.62
5.	Minyak Goreng	L	1365.75	295	258	2061	1021.5	5001.25	4991.25
6.	Label	Pcs	1821	590	516	2061	2043	7031	7381
7.	Plastik Kemasan	Pcs	1821	590	516	2061	2043	7031	7381

Based on the details of raw material requirements, then further determine the amount of odor material that must be ordered to suppliers based on the packaging requirements of each supplier. Then based on the packaging conditions, the following results are obtained.

Table 9. Amount of Raw Materials That Must Be Ordered

No	Bahan Baku	Jumlah Bahan Baku Yang Harus Dipesan
1.	Pisang (Kg)	1860
2.	Tepung Beras (Kg)	850
3.	Tepung Tapioka (Kg)	550
4.	Pasta Gula (Kg)	170
5.	Minyak Goreng (L)	4992
6.	Label (Pcs)	7400
7.	Plastik (Pcs)	7400

Based on Table 7, the results obtained are the number of raw materials that must be ordered for the period July 2018. Furthermore, according to the distribution of types of raw materials, namely raw materials that can be stored for a long time made an order every month, and raw materials that cannot be stored for long periods of order are made every week. . So, the raw materials that cannot be stored for long, namely the Banana raw material with an amount of 1860 are made per week assuming 1 month = 4 weeks.

Then the number of orders per week of banana raw materials as follows:

1860/4 = 465 kg

The final results of the total amount of raw materials that cannot be stored for a long time to be ordered can be seen in table 5 and table 6.

Table 10. Ordering Raw Materials That Cannot Be Stored Long Time

No	Bahan Baku	Jumlah	Supplier	Packaging	Keterangan
1	Pisang	470 Kg	UD. Dinamis	47	*packaging* 10Kg

Table 11. Ordering Raw Materials That Can Be Stored Long Time

No	Bahan Baku	Jumlah	Supplier	Packaging	Keterangan
1	Tepung Beras	850 Kg	PT. Sungai Budi (Rose Brand)	17	*packaging* 50Kg
2	Tepung Tapioka	550 Kg	PT. Sungai Budi (Rose Brand)	11	*packaging* 50Kg
3	Pasta Gula	170 Kg	PD. Sumber Makmur	34	*packaging* 5Kg
4	Minyak Goreng	4992 L	PT. Sungai Budi (Rose Brand)	2496	*packaging* 2L
5	Label	7400 Pcs	PD. Agung	74	*packaging* 100Pcs
6	Plastik	7400 Pcs	PD. Agung	74	*packaging* 100Pcs

C. Checking Raw Material Analysis Orered

This stage is the stage of checking the suitability of the results of the procurement of raw materials with the amount of raw materials received from suppliers. The following is the amount of raw materials based on procurement results with the amount of raw materials received from suppliers in June 2018, which can be seen in table 7.

Table 12. Monitoring Raw Materials Ordered

No	Bahan Baku	Jumlah Berdasarkan Kebutuhan Pengadaan	Jumlah Bahan Baku Yang harus dipesan ke Supplier
1.	Pisang (Kg)	1851	1860
2.	Tepung Beras (Kg)	830	850
3.	Tepung Tapioka (Kg)	542	550
4.	Pasta Gula (Kg)	167	170
5.	Minyak Goreng (L)	4992	4992
6.	Label (Pcs)	7381	8500
7.	Plastik (Pcs)	7381	8500

D. Analysis Of Raw Material Control Measures

This stage is the stage of action that must be done based on the amount of raw materials ordered to the supplier by controlling the amount of raw materials. Here are the results of the amount of raw materials based on the results of procurement and the amount of raw materials that must be ordered to suppliers and the actions that must be taken.

Table 13. The Result of Ordered Raw Materials Control

No	Bahan Baku	Jumlah Berdasarkan Kebutuhan Pengadaan	Jumlah Yang harus dipesan ke Supplier	Keterangan
1.	Pisang (Kg)	1851	1860	Sisa dari kelebihan dapat digunakan untuk proses produksi jika dibutuhkan atau disimpan di gudang untuk perencanaan pengadaan bahan baku periode selanjutnya
2.	Tepung Beras (Kg)	830	850	Sisa dari kelebihan dapat digunakan untuk proses produksi jika dibutuhkan atau disimpan di gudang untuk perencanaan pengadaan bahan baku periode selanjutnya
3.	Tepung Tapioka (Kg)	542	550	Sisa dari kelebihan dapat digunakan untuk proses produksi jika dibutuhkan atau disimpan di gudang untuk perencanaan pengadaan bahan baku periode selanjutnya
4.	Pasta Gula (Kg)	167	170	Sisa dari kelebihan dapat digunakan untuk proses produksi jika dibutuhkan atau disimpan di gudang untuk perencanaan pengadaan bahan baku periode selanjutnya
5.	Minyak Goreng (L)	4992	4992	Digunakan untuk proses produksi
6.	Label (Pcs)	7381	8500	Sisa dari kelebihan dapat digunakan untuk proses produksi jika dibutuhkan atau disimpan di gudang untuk perencanaan pengadaan bahan baku periode selanjutnya
7.	Plastik (Pcs)	7381	8500	Sisa dari kelebihan dapat digunakan untuk proses produksi jika dibutuhkan atau disimpan di gudang untuk perencanaan pengadaan bahan baku periode selanjutnya

Based on Table 8 that the amount of raw materials based on the results of procurement with the amount of raw materials that must be ordered to suppliers there are differences. So what the company must do is if the amount of raw material is sufficient, it can be used for the production process, whereas if there is an excess of raw materials, the rest of the required raw material can be used for the production process if needed, or stored in a warehouse for material procurement planning standard in the next period.

2.10 *Entity Relationship Diagram* (ERD)

In modeling the data and describing the relationship between the data that exists in the manual asset system of the company used tools that is the E-R diagram. From the ongoing procurement manual system, the relationship between entities can be seen. For this reason, it is proposed to design the E-R diagram in which there is a unique key (primary key) in each entity (parent table) that can distinguish with other attributes so that the table can be used as a reference for other tables [10]. The following is the Entity Relational Diagram (ERD) which can be seen in Figure 3.

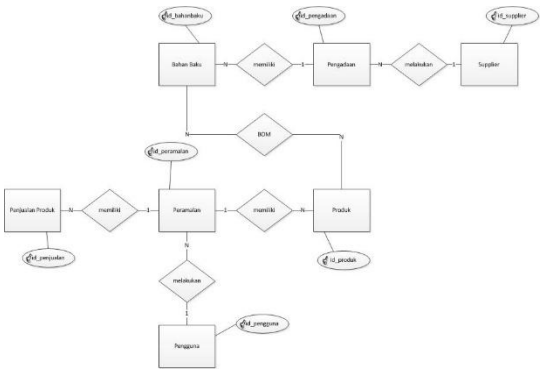

Figure 3. Entity Relationship Procurement Management Information System Diagram CV. Radja Sale

2.11 Context Diagram

Context Diagram is a diagram that serves to describe the flow of data between the system and external entities. The context diagram of this system can be seen in Figure 4.

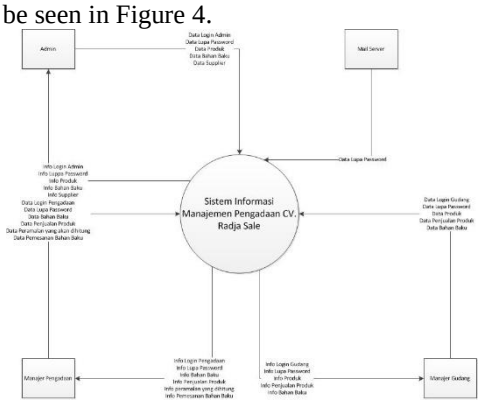

Figure 4. Context Diagram Of Procurement Management Information System CV. Radja Sale

Relationship table aims to describe the relationship of tables in the system in detail or clearly, so use the relations table. The relation table will be explained in figure 5.

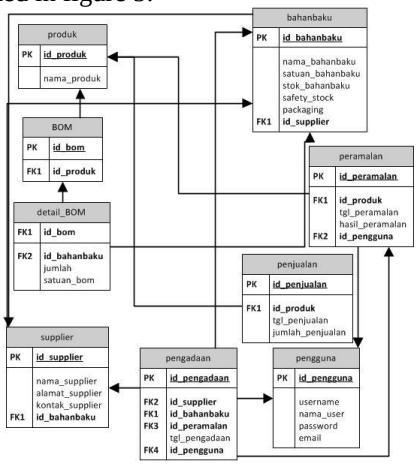

Figure 5. Relations Table

2.12 System Testing

System Testing Phase is the stage used to test whether the system is built accordingly. Testing of Procurement Management Information System CV. Radja Sale will be tested with two stages of testing, namely alpha and beta testing

2.12.1 Conclusion *Alpha* Testing

Based on the results of testing with test sample cases that have been carried out, it concludes that most of the processes are correct. The system can be run in a corporate environment.

2.12.2 Conclusion *Beta* Testing

After an interview in the CV. Radja Sale can be concluded that this information system has helped the CV. Radja Sale in managing the planning of ordering raw materials to suppliers, managing master data, forecasting, monitoring inventory of raw materials, and managing ordering of raw materials is still not achieved, in terms of the use of the language used is good, easy to use and the interface is quite good and still need to be developed again

3. CLOSING

3.1 Conclusion

Application Based on the description of the discussion of the analysis that has been done, it can be concluded that the Procurement Management Information System on the CV. Radja Sale as follows:

1. Procurement Management Information System at CV. Radja Sale is sufficient to assist warehouse managers in monitoring the availability of raw materials in the warehouse and planning the amount of raw materials that must be ordered for the coming period to support the production process.
2. Procurement Management Information System at CV. Radja Sale is sufficient to assist procurement managers in planning the amount of raw materials that must be ordered for the coming period for production needs, so as to reduce the possibility of a condition of shortage or excess of raw materials which causes delays in the production process.

3.2 Suggestion

Procurement Management Information System at CV. Radja Sale can only manage raw materials. Therefore, it is expected that in its development the raw material ordering process will be more dynamic in viewing the order history of the previous period so that it is well integrated. It is also expected to be able to manage the details of raw materials entering and leaving the warehouse so that monitoring of raw materials in the warehouse is better.

REFERENCE

[1] M. P. Jogiyanto HM., Analisis & Desain Sistem Informasi Pendekatan Terstruktur Teori dan Praktek Aplikasi Bisnis, Yogyakarta : Andi, 2005.

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

[3] Sokovic, M., Pavletic, D. & Pipan, K. K., November 2010. Quality Improvement Methodologies – PDCA Cycle, RADAR Matrix, DMAIC and DFSS. JAMEE, 43(1), pp. 476-482

[4] Taufik, Muh. 2010. Monitoring dan Evaluasi.Jakarta : PNPM-PPK.

[5] Nur Bahagia, senator. 2006. Sistem Inventori. Bandung: Penerbit ITB

[6] Spyros Makridakis, Steven C. Wheelwright, 1994. Metode-Metode Peramalan Untuk Manajemen, Jakarta: Bina Rupa Aksara.

[7] A. Kadir, 2008. Dasar Perancangan dan Implementasi Database Relational. Yogyakarta: Andi Publisher.
[8] R. S. Pressman, 2012. Rekayasa Perangkat Lunak, Solo: Andi Publisher.
[9] Al Bahra Bin Ladjamudin. 2006. Rekayasa Perangkat Lunak. Yogyakarta: Graha Ilmu.
[10] U. D. Widianti, "Pembangunan Sistem Informasi Aset di PT. Industri Telekomunikasi Indonesia (PERSERO) Berbasis Web*," Jurnal Ilmiah Komputer dan Informatika (KOMPUTA)*, vol. I, no. 2, p. 3, 2012.