SUPPLY CHAIN MANAGEMENT DI KOPERASI PETERNAKAN BANDUNG SELATAN PANGALENGAN (KPBS)

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ABSTRACT

South Bandung Livestock Cooperative PANGALENGAN (KPBS) is a cooperative company engaged in dairy farms located in the area of animal husbandry and agriculture PANGALENGAN Bandung regency. Problems that exist at present in the Cooperative Ranch South Bandung PANGALENGAN (KPBS), ie at the time of procurement of raw materials to suppliers that reservations are often made without specifying a limit when to book a return back to the supplier and the delay distribution in the delivery of goods, then in need a development system of Supply Chain Management in Animal Feed Processing Unit (UPP) South Bandung Livestock Cooperative PANGALENGAN (KPBS).

Supply Chain MANAGEMNET is competent business resource integration in the distribution of goods, including the planning and management of procurement activities and logstik and related information ranging from raw materials. Forecasting methods used to estimate the amount of demand for the products is the method of Single Exponential Smoothing. Calculation predictions availability of raw materials in the warehouse uses the method of securing supplies (safety stock).

Based on the test results can be concluded that this system has helped manage a list of product orders from customers, to help estimate the number of bookings to suppliers of raw materials and assist in determining the delivery schedule as well as used vehicles. Tests are used to test the new system is a black box testing methods. Black box testing focused on testing the functional requirements of information systems.

Keywords: supply chain management, supplier, single exponential smoothing, safety stock, black box.

1. PRELIMINARY

South Bandung Livestock Cooperative PANGALENGAN (KPBS) is a cooperative company engaged in dairy farms located in the area of animal husbandry and agriculture PANGALENGAN Bandung regency. KPBS has two processing units, namely raw materials Feed Processing Unit (UPP) and the Milk Processing Unit (UPS). Managament supply chain activities that are upstream conducted by KPBS with a supplier that is doing the procurement of raw materials to suppliers, for the acceptance of raw materials from suppliers, and conduct raw processing into products.

Based on the interview with Mr. Apriyadi Rachmanto as manager UPP. There are problems at the time of procurement of raw materials to suppliers, ie booking which is often carried out without specifying the limits when to book a return back to the supplier. The cause is often a shortage of raw material inventory during the production process caused by the factors of raw material has a temperature, moisture, and humidity change during storage that may result in any material shrinkage. So that the parts procurement difficulties in determining the approximate amount of raw materials that will be ordered back to the supplier.

Purchase Process to suppliers of raw materials to the raw materials received by the warehouse requires a waiting period of three to four days of the supplier, so that if the stock of raw materials have a vacancy will affect the estimated time of manufacture and cost overruns while doing production.

Based on the interview with Mr. AEP as Head of Goods Feed and HMT. The process of product distributor TPK to do if the stock of products stored in the warehouse are available and ready to be distributed, because the distribution system used UPP ie pull distribution system (push system). Distribution of products to TPK adjusting the feed part time working hours and HMT. Limitations of transportation and mileage will be sent an order products become obstacles when conducting product distributor, as a means of

transportation that will be used should also include the distribution of any other processing unit. KPBS itself has 10 units of vehicles consisting of two units Puso capacity of 15 tons per unit, 3 units Engkel capacity of 4 tons per unit, 3 unit Diesel car with a capacity of 7 tons per unit, 3 units, and one unit of a pickup 1 ½ ton , Thus implementing the distribution of feed and forages Goods section takes right at the time of distribution, consequently distributor pruduk late and need the products ordered by TPK do not correspond with the time and place specified scheduling.

Based on the description of the problems that exist at the moment in South Bandung Livestock Cooperative PANGALENGAN (KPBS), then needed a system development Supply Chain Management in Animal Feed Processing Unit (UPP) South Bandung Livestock Cooperative PANGALENGAN (KPBS).

The purpose of this study was to establish an information system using the approach of Supply Chain Management (SCM) in South Bandung Livestock Cooperative PANGALENGAN (KPBS).

The purpose of this research is:

1. Feed Processing Unit Manager makes it easy to determine the approximate amount of raw materials to be ordered to the supplier
2. Easing the head of the Feed and forage in the distribution process and schedule a distributor of products in the distribution of products to the place of Cooperative Services.

2. RESEARCH

2.1 Information System

The information system can be defined as a set of components sekumpulan- interconnected and work together to collect, process, store and distribute relevant information to support decision-making, coordination and control that is therein. The purpose of the system is to provide information and mensistemastikkan information of all events or activities that are necessary to control the operation of an organization. The activities referred to in this information system including taking, processing, storing, and conveying the necessary information within the operate all the activities of the organization concerned.

2.2 Analysis of Supply Chain Management

Definition of supply chian management SCM issued by experts and institutions worldwide SCM dilatar-background by knowledge, scope and importance of each. Understanding SCM cited by the author, defines the appropriate SCM comprehensive perspective based on the concept of academic (knowledge), bussines (business) and the government (regulator). [2]

Supply Chain MANAGEMNET is integrating resources competent business in the distribution of goods, including the planning and management of procurement activities and logstik and related information ranging from raw material X increase productivity throughout the merged company in the supply chain through optimalisi quality and supply chain management is a business function vital to coordinate management of the flow of goods and is a key competence. [2]

Link SCM (SCM Network) consists of seven chains that suppliers, manufacturers, warehouse, transportation, distributor, retailer and customer. [2]

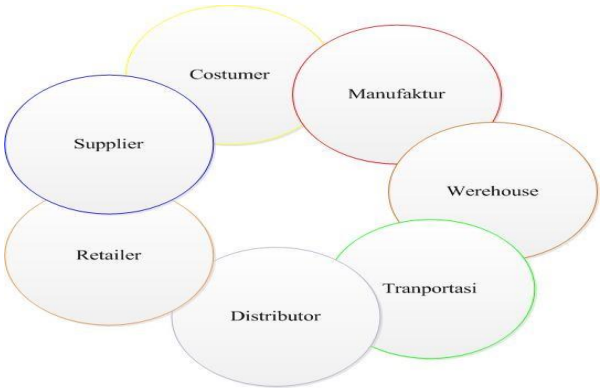


Figure 1. Link Supply Chain Management

Integrating and mensingkronisasikan suppliers, manufaktr and distributors.

1. Products produced and distributed meet the quality, quantity, time and destination.
2. Optimize costs and increase saaing and services pelanggan.Mengurangi number of suppliers
3. Reducing non uniformities, surcharges, the negotiation process and time tracking (tacking).
4. The tendency of the concept of multiple changes to a single supplier.
5. Partnership (partnership / strategic alliances).
6. Supplier partnership is a partnership that can ensure the smooth flow of goods.
7. Implement continuous development in cost efficiency and quality of goods.

SCM activities closer to sourcing and procurement directly to manufacturers, without going through intermediaries that will add to the cost. Supplier in SCM means the manufacturer, not a middleman.

SCM Supply Chain Management activities include:

1. Upstream Supply Chain (Upstream Supply Chain), including manufacturing companies and suppliers.
2. Internal Supply Chain (Internal Supply Chain), covering storage and production processes.
3. Downstream Supply Chain (Downstream Supply Chain), include distributors and consumers.

Supply chain management is essentially the scope of work and responsibilities that luas.Semua activities related to the flow of material, information, and money along the supply chain are the activities in the scope of supply chain management. [3]

Table 1. Area Coverage Supply Chain Management

Part	**Event coverage**
Develovement Product	Conducting market research, designing new products, involving suppliers in the design of new products
Procurement	Selecting suppliers, evaluating supplier performance, do pebelian raw material components, monitor risk pamasok, develop and maintain relationships with suppliers
Operations and Production	Demand planning, demand forecasting, capacity planning, production planning and inventory
Operasi dan Produksi	Execution of production and quality control
Distribution	Network planning, scheduling, distribution, seek and maintain relationships with the company, distribution services, monitor service tingakat at each distribution center

Supply chain management involves so many parties both inside and outside the company as well as a range of activities addressing a very luas.Dalam face many uncertainties that exist along the supply chain as well as the increasing competition in the market, supply chain management requires an approach and robust management model for bias bisnis.Beberapa survive in the world of challenges that must be faced by the company in managing the supply chain. [3]

2.3 Theory of Forecasting

Resolve problems in the future is uncertain, people always trying to solve with models of approaches in accordance with the actual behavior of the data, as well as in forecasting. Forecasting (forecasting) demand for products and services in future and its units is very important in the planning and supervision of production. A forecasting many have meaning, then the forecasting needs to be planned and scheduled so would have required a time period of at least the period of time required to make a wisdom and set some things that affect these policies. Forecasting is required in addition to predict what will happen in the future also the decision makers need to transform and make planning. Forecasting is very diverse in forecasting time horizon, the factors that determine the actual result, the type of pattern and various other aspects. To deal with such widespread use, several techniques have been developed. One technique in which forecasting method Smoothing (smoothing). [4]

A forecasting Noteworthy stages that must exist in the forecasting process. There are six stages in the process of forecasting, namely:

1. Determining the purpose of divination.
   How will the forecast used and when it will be required forecast?
   This stage will give an indication of the level of detail required in the forecast, the amount of resources (staff, time, computer, and charges) will be justified, and the level of accuracy required.
2. Setting a time frame.
   Forecast must indicate the span of time, considering that the accuracy decreases as the time span increases.
3. Selecting forecasting techniques.
4. Acquiring, cleaning, and analyzing the right data.
5. Obtained data can include significant effort. After obtaining the data of the data may need to be "cleaned up" in order to remove foreign objects and data that clearly is not true before analysis.
6. Make predictions.
7. Monitor forecasts.

Forecasts should be monitored to determine whether the forecast is done in a satisfactory manner. If it is not satisfactory, check the forecasting methods, assumptions, data validity, and others. Then, turning as needed and preparing the forecast revision.

Forecasting types can be distinguished based on duration, scope and methods used. [6]

1. Based on the time period, forecasting can be divided into short-term and long-term.
2. Based on the scope of forecasting can be divided into micro and macro forecasting.
3. Based on the forecasting methods used, forecasting can be divided into qualitative and quantitative methods. [6]

2.3.1. Single Exponential Smoothing

In smoothing historical values, the random error in the averaged to produce a forecast "smooth" that seems to work well in a state yanng tertentu.Kasus simplest of Single ExponentialSmoothing can be developed from the equation (2.7) or, more specifically from a variety Reviewed tersebutyaitu equation as follows [4]:

$$F_{t+1}=F_t+\left(\frac{X_t}{N}\frac{X_{t-N}}{N}\right) \qquad (2.7)$$

Suppose the old observations are not available and should be replaced with a value approach (approximation). One possible replacement is the forecast value of the previous period. By doing this substitution equation (2.7) into the equation (2.8) so it can be rewritten as (2.9) [4].

$$F_{t+1} = F_t + \left(\frac{X_t}{N}\frac{F_t}{N}\right) \qquad (2.8)$$

$$F_{t+1} = \left(\frac{1}{N}\right)X_t + \left(1\frac{1}{N}\right)F_t \qquad (2.9)$$

From equation (2.3) it can be seen that the predictive value at time t + 1 depends on the weighting of the value of the observation time t, the weighting and the predictive value when t is 1 - a value between 0 and 1. By replacing. Equation (2.9) into the equation (2.10) [4].

$$F_{t+1} = \alpha X_t + (1-\alpha)F_t \qquad (2.10)$$

Information :
F_{t+1} = Result forecast for period t + 1
α = Constant smoothing
X_t = Actual demand data for the period t
F_t = Forecast in period t

In the method of exponential smoothing α value can be determined freely, meaning there is no sure way to get the optimum value of α. The selection of the value of α is done by trial and error. The amount of α lies between 0 to 9 [4].

The first thing to do to calculate the Single Exponential Smoothing forecasting method of determining the value of the constant alpha = 0.1 and forecast the demand for the 2nd time. The values of variables are taken from actual data product order.

Examples of the prediction for α = 0.1:

Based on data Product Order Regular type consentrat in Table 3.2, compute forecasting bookings for the month of August 2015.

Noted :

Consentrat regular request in February (Xt) = 1.52048 million and forecasting results in March (Ft) = 1.52048 million, due in February can not be calculated so the calculation results obtained sample calculated as shown below:

Example Calculations for α = 0.1
F*februari*i = (0.1 * 1,520,480) + (1- 0.1) * 1,520,480
= (152,048) + (1,326,432)
= 1.52048 million Kg.

For the calculation of March, it is known that: Consentrat regular product order in March (Xt) = 1.61308 million and forecasting results in February (Ft) = 1.52048 million, so we get an example of the calculation as follows:

Fmaret = (0.1 * 1,520,480) + (1- 0.1) * 1,613,080
= (152,048) + (1,451,772)
= 1.60382 million Kg

The calculations for the month of March and then performed in the same manner in accordance with the calculation of bookings in February-March.

Example Calculations for α = 0.2.

Based on data from the type of raw material usage bran in Table 3.2, compute forecasting bookings for the month of September 2015.

Noted :

Consentrat regular product demand in February (Xt) = 1.52048 million and forecasting results in February (Ft) = 1.52048 million, due in January not be calculated so the calculation results obtained sample calculated as shown below:

F*Februari* = (0.2 * 1,520,480) + (1- 0.2) * 1,520,480
= (304,096 + (1,216,984)
= 1.52048 million Kg

For the calculation in March:

Consentrat regular product demand in February (Xt) = 1.61308 million and forecasting results in February (Ft) = 1.539 million, so we get an example of the calculation as follows:

F*Maret* = (0.2 * 1,520,480) + (1- 0.2) * 1,613,080
= (304,096) + (1,290,464)
= 1.59456 million Kg.

Calculation of alpha = 0.2 months of March and then performed in the same manner with the prediction bookings in February and March. Make a prediction in the same manner as above up to alpha = 0.9.

After all calculations of α = 0.1 to 0.9 is done then the next step can determine forecasting results which can be used is to calculate the value of the smallest error from the forecast because the smaller the value of the prediction error then less and less misses. Calculation error value using the MSE (Mean Squared Error) with the formula (2.19) is described in chapter 2. The sample calculations for α

MSE 0.1 is as follows:
MSE = (Xfmaret - Fmaret) 2
= (1.613.080- 1,520,480) 2
= (92600) 2 = 8,574,760,000

MSE results for the month of March 2015 is 8.57476 billion, which is derived from demand in March as much as 1.61308 million minus forecasting results in March that is 1.52048 million and didaptakan results of 92,600, after which the final outcome is squared 8.57476 billion.
The same calculation as the example above is done until the period of the 7th. After calculating the MSE until the period of the 7th, the next step sum of the MSE of the period 2nd through 7th periods. Then obtained the results as follows:

MSE = (Σ|Ft - Y | 2)
n
= (56.597.236.872.04 2)
7
= 8,085,319,553.15

The results of the sum of the period 2 to period 7 that 56.597.236.872.04 then split 7 that entire period, the results obtained 8,085,319,553.15 is the result of the overall error of the period for alpha = 0.1.
MSE calculation as above of α = 0.1 to α = 0.9 to do to get the MSE for α = 0.1 to α = 0.9. Based on the calculation of MSE for all α = 0.1 till 0.9 Total Score obtained MSE calculation results as shown in Table 3.4

2.3.2. Mean Squared Error (MSE)

Forecast error used in the calculation for meguji forecasting results is the Mean Absolute Error (MSE). MSE is the average of the squared forecasting errors. MSE can be found using equation (2.5).

$$, MSE = \frac{\Sigma(X_t - F_t)^2}{n}. \quad . (2.19)$$

Information:
X_t = The actual data in period t
F_t = Data predictions are calculated from the model used in period t
n = A lot of the data forecast results

2.3.3. Safety Stock

Orders an item until the item comes required time period varies from a few hours to months. The time difference between when the book until the goods come known as the grace period (Lead Time). Lead times are influenced by the availability of goods ordered and the distance between the location of the buyer and supplier. Grace period of uncertainty resulted in a shortage of goods, for example due to the use of goods greater than previous estimates, and therefore required a persediaaan safety (safety stock). Safety Stock If set too low, supplies will run out before acceptable replacement supplies so that production can be disrupted or customer request can not be met. The raw product inventory planning has been taken into account yet often raw product inventory is not sufficient because often meloncatnya supplies production of the company or supplies were damaged and does not meet the standards to meet consumer demand. Safety stock formula (safety stock) can be calculated with Equation 2.21.

Safety Stock = Usage Average Period Previous x Lead Time (2:21)

Where: Lead Time = timeout.

As examples of the calculation of safety stock (2.90) for the types of mineral raw materials for the month of September 2015 is as follows:

Estimated raw materials were booked = 1567 Kg

Number of days in September = 30 days
Lead time to suppliers = 3 days

completion:

Saftey stock = (1567/30) x 3
= 156.7 Kg. (156)

Then the stock should be available for the needs of the mineral raw material inventory is is 156 kg.

2.4. Distribution

In supply chain management are distributing the product. Coverage existing distribution activities include monitoring products that are ready to send,

distribution status monitoring, scheduling and capacity distribution of vehicles to be used in the distributor of products to customers. Monitoring the distribution is done so that the products reach the end user at the right time and place, monitoring the status of the distribution was conducted to determine the status of the distributor if the product is up to the customer premises or still in the process of distribution. Scheduling activities on the distribution made to customers with the schedule agreed with each other, scheduling pengirman can be determined by looking at the orders which products are being manufactured and are ready to be sent, then the company determines the vehicle used to deliver the product adapted to the capacity of the vehicle at the time distribution.

2.5. Entity Relationship Diagram (ERD)

Database analysis merupakam analysis phase to describe a system that will be made in the form of relationships - relationships between the entities involved in the supply chain management information system in the UPP KPBS. Relationships The relationships depicted in diagrammatic form the so-called entity rwlationship diagram. ERD supply chain management information system in the UPP KPBS can be seen in the following figure.

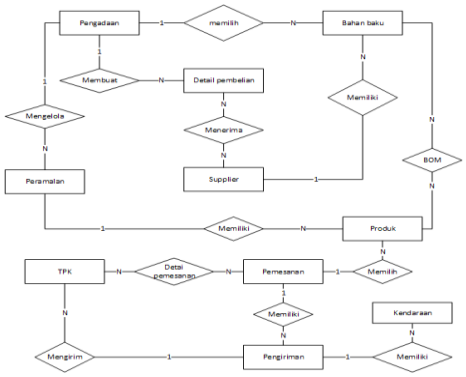


Figure 3. Entity Relationship Diagram 12 UPP KPBS

2.6. Diagram Context

Diagram context is a global model to explain how the data is used and transformed to the process or describe the flow of data into and out of the system. Diagram context on this system can be seen in Figure 3:12

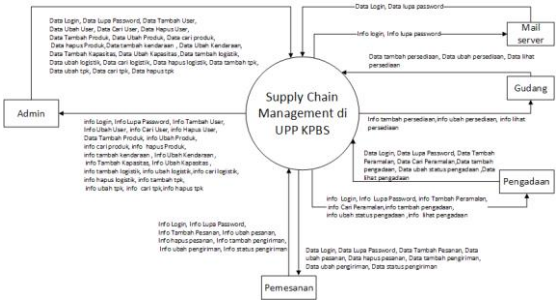


Figure 3. Diagram Context 1 UPP KPBS

2.6. DFD Level 1

DFD Level 1 Supply Chain Management in UPP KPBS in Figure 3.13 describes the general process of what to do on the system

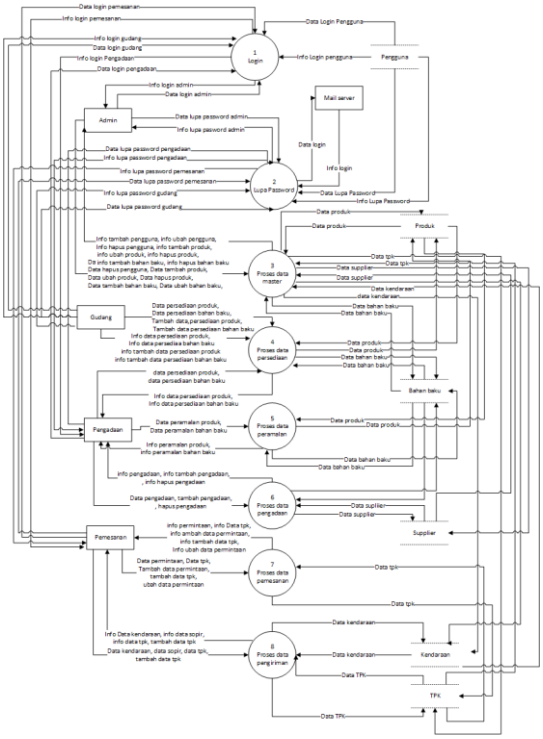


Figure 3. 2 DFD Level 1

Describing the connectedness table in the system in detail or clear, the use of table relationships. Table relationships are described in Figure 3.6.

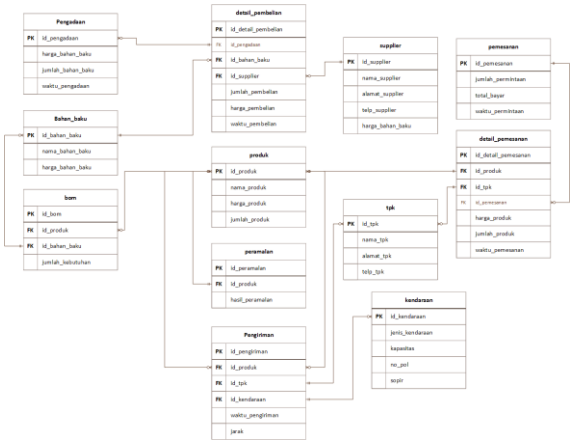


Figure 3:29 Table Relationships Supply Chain Management UPP KPBS

Testing of the system is the cornerstone that aims to find mistakes or shortcomings in the information system under test. The test intends to determine the information system are made in compliance with the performance in accordance with the design objectives.

Tests are used to test the new system is a black box testing methods. Black box testing focused on testing the functional requirements of information systems.

Test plan will do is to test the system built by Black Box and beta. Testing construction porduk information distribution system in KPBS UPP test data based on data provided from some of the data that has been given.

2.7. Testing Black Box

Black box testing is testing conducted objectively where tested directly into the field, a company that circumstances regarding user satisfaction with the content of the points that meet the needs of the initial objectives and the interface of the information system of the Supply Chain Management. Beta testing is done through a technique of data collection, namely through interviews.

Interviews were conducted with a beta test for the page of each user consists of the operator ordering, warehouse, procurement and delivery section. Tests conducted on beta testing is testing the software directly in the corporate environment or a place to study the Feed Processing Unit KPBS. This is done in order to know whether the software that was built to provide a solution of some problems faced by the company.

2.8. Black Box Testing

1 These information systems are built to facilitate the booking operator part in processing the product ordering process from customer
2 The information system built to facilitate the warehouse to monitor raw material inventory in the warehouse
3 The information system built to facilitate procurement in estimating demand for products ordered by customers

The information system built to facilitate the procurement section in determining the amount of raw material procurement ordered to supplier

3. COVER

3.1 Conclusions

Based on the results obtained in this thesis, it can be concluded as follows:

1. These information systems are built to facilitate the procurement part in determining the raw materials to be ordered to the supplier to see any estimates of raw materials will be ordered for a period for some period in the future.
2. The information system built to facilitate the delivery part in determining the schedule for delivery of finished products as well as used vehicles.

3.2 Advice

Suggestions for the development of information systems are some suggestions that can be done, among others:

1. The need for the development and maintenance of better the system that has been built, so that the system can be used according to the needs in the future.
2. The need for development to manufacture customer access rights (TPK) in order to facilitate the company in selling products to a cooperative service, because the current facility or system is still support for the internal persuhaaan only.

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