SUPPLY CHAIN MANAGEMENT IN CV. HILMI JAYA

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ABSTRACT

CV. Hilmi Jaya is a company engaged in the field of knitting convection in producing clothing made from knitting yarn and established since 1990. Knitted products offered by CV. Hilmi Jaya has a variety of models such as knitted spandex cardigan, child clothing, long cardigan, and roundhand. CV. Hilmi Jaya in the procurement of raw materials to suppliers often experience difficulties due to the procurement of raw materials that still use estimates only. Supply chain strategy used is push supply chain, because it determines the products produced first before the order made to make the product stock in the warehouse or can be called make to stock. The forecasting method used to estimate the number of product demand is Single Moving Average method. Calculation of predicted availability of raw materials and products in the warehouse using the method of securing the inventory (Safety Stock). Product distribution schedule is adjusted to the business rules in the company. Based on blackbox testing results and final testing after application in CV environment. Hilmi Jaya can be concluded that this system has helped CV. Hilmi Jaya in helping to estimate the number of ordering raw materials to be purchased to suppliers, monitor product inventory at branch offices and assist in monitoring the distribution schedule along with the vehicle used.

Keywords: *Supply Chain Management, Single Moving Average, Push Supply Chain, Safety Stock, blackbox*

1. PRELIMINARY

CV. Hilmi Jaya is a company engaged in the field of knitting convection in producing clothing made from knitting yarn and established since 1990. Knitted products offered by CV. Hilmi Jaya has a variety of models such as knitted spandex cardigan, child clothing, long cardigan, and roundhand. CV. Hilmi Jaya is the head office located in Binong Jati Bandung City. And currently has 5 branches, 2 are in Cicalengka, and 3 are in Solo, Jakarta, and Tasikmalaya. Based on sales data of black spandex cardigan products from March 2017 to August 2017. Black spandex cardigan products are the products most demanded by consumers. The current supply chain process in CV. Hilmi Jaya started from upstream to downstream. Upstream activities include procurement of raw materials, raw material acceptance and processing of raw materials into products, while downstream activities include ordering products from consumers and distributing products to branches. In its business process, CV. Hilmi Jaya uses the make-stock strategy [2].

Based on the results of interviews with the head of CV procurement. Hilmi Jaya, Mr. Asep, explained that the procurement process of raw materials to suppliers still use estimates only, and is done every month from 1 to 5 to meet production needs for 1 month. This sometimes results in the stock of knitting yarn being in shortage when there is an increase in product ordering as contained in Annex F (Appendix E, Table E.4 - E.9 Data of raw material stock from March 2017 to August 2017), and impacting in the production process becomes obstructed. So the Head of Procurement has constraints in the process of procurement of raw materials to suppliers.

Based on the results of interviews with Mr. Deden, as Manager CV. Hilmi Jaya stated that the process of monitoring the product inventory is currently done every day by contacting each branch office by phone. Sometimes when branch office A does product requests to headquarters, but the headquarters does not have sufficient product inventory. Then the manager will contact the nearest branch office to find out the product inventory requested by the branch office of A which is done when it is possible to move. This will take longer and cause the phone charges to increase. So Manager experienced constraints in the process of monitoring the product inventory in each branch

office if the product inventory in the CV. Hilmi Jaya experiencing vacancy.

Based on the results of interviews with Mr. Jajang, as Head of Distribution CV. Hilmi Jaya stated that the process of distributing products to branch offices is currently awaiting request from the branch. Sometimes when there is a concurrent product demand from each branch and the vehicle capacity is insufficient to transport all products. With vehicles available only 2 units of grandmax and mitsubishi box l300. He must be able to know whether the vehicle used for the distribution of the product is correct or not, so that all product requests from all branch offices can be fulfilled. So the Chief Distribution experienced difficulties in monitoring the process of distributing products to each branch office.

Based on the exposure of the problem, then needed a system to determine the amount of raw material inventory, monitoring of product inventory, and monitoring process of distribution of product by using Supply Chain Management system.

1.1 Formulation Of The Problem

Based on the background exposure above, then the problems that occur in the CV. Hilmi Jaya is how to build Supply Chain Management in CV. Hilmi Jaya.

1.2 Purpose and Objectives

The purpose of this final project is to build Supply Chain Management in CV. Hilmi Jaya. The purpose of Supply Chain Management development in CV. Hilmi Jaya is as follows:

a. Facilitate the procurement head to determine the amount of raw materials to be ordered to the supplier.
b. Facilitate company managers in monitoring product inventory in every branch office CV. Hilmi Jaya.
c. Facilitate the distribution head to monitor the process of distributing products to branch offices.

1.3 Scope Of The Problem

Limitations of the problems in this study are as follows:

a. Input data that is processed is product sales data, supplier data, raw material stock data, vehicle data, distribution data.
b. b. The product data processed is the data cardigan black spandek product due to the large number of requests on the product.
c. c. Forecasting method for product demand planning using Single Moving Average because the pattern of data movement on sales chart of black color spandex card show the pattern of fluctuative irregularly and to determine safe stock of product use safety stock.
d. Monitoring of inventory of branch office products using the minimum stock specified by the head of the branch office.
e. The method of analysis that will be used in the development of this system is based on structured analysis, where the data modeling is using ERD (Entity Relationship Diagram) and to describe its functional modeling using DFD (Data Flow Diagram).
f. The system is built in the form of web-based applications.

1.4 Research Methodology

Methodology is a process used to solve a logical problem, which requires data to support the implementation of a study. The methodology used in this research is descriptive. Descriptive methodology is a methodology in examining the status of a group of people, an object, a set of conditions, a system of thought or a class of events in the present. Where the purpose of this descriptive methodology is to obtain a clear picture of facts and information in the present situation or situation systematically, factually and accurately.

The steps that will be carried out during the research can be seen in Figure 1.1.

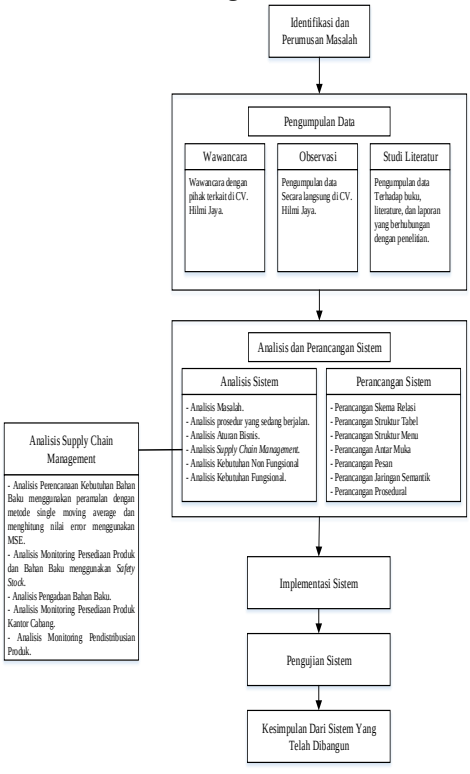


Figure 1 Research Flow

1. Identification Of Problem

This stage is the initial stage of starting the research by identifying the problems or constraints that occur in the CV. Hilmi Jaya, then formulate the problem in CV. Hilmi Jaya, then will be determined what methods suitable to be applied to the system to solve existing problems.

1. Formulation Of Inten And Purpose

At this stage the researcher determines the purpose and objectives to be achieved to solve the problems that exist in the CV. Hilmi Jaya.

2. Data Collection

At this stage the researcher determines all the data needed to be used on the system as input data in the forecasting and controlling stage of the product. Here are the steps used in data collection.

3. Interview

Interview conducted to parties related to research in CV. Hilmi Jaya.

4. Observation

Observations made is the collection of data obtained directly in the CV. Hilmi Jaya.

5. Study Of Literature

The literature study was conducted by collecting research data on books, literature, and related reports in solving research problems.

6. Analysis And Design System To Be Built

At this stage the researcher analyzes the needs of the system design. Here are the steps used in the analysis and design.

7. System Analysis

System analysis is the stage of analyzing the system to be built to match the needs that fit the problem. This stage consists of:

a. Analysis of Current System
   - Problem Analysis
   - Analysis of Current Procedures.
   - Analysis of the Current Business Rules.
   - Analysis of Business Rules on the system to be built.

b. Analysis of Supply Chain Management Method
   - Planning Analysis of Total Needs of Raw Materials using forecasting with Single Moving Average method and Calculating error value using MSE (Mean Square Error).
   - Analysis of Inventory Monitoring of Products and Raw Materials using safety stock.
   - Analysis of raw material procurement.
   - Analysis of Branch Office Inventory Monitoring.
   - Analysis of Product Distribution Monitoring.

c. Non Functional Needs Analysis
   - Hardware Requirement Analysis.
   - Requirements Analysis Software.
   - User Analysis.
   - Coding Analysis.

d. Functional Needs Analysis
   - Database Analysis
   - Context Diagram
   - Data Flow Diagram
   - Process Specs and DFD Data Dictionary

8. System Planning

System design is the stage of designing the system to be built in accordance with the results of the analysis. This stage consists of:

- Relation Scheme
- Table Structure
- Menu Structure Design
- Interface Design
- Message Design
- Semantic Network Design Procedural Design
- Procedural Design

9. Pembangunan Sistem

This stage is the stage of building a system based on the results of analysis and system design so that the system built will be in accordance with the needs of the results of analysis and system design.

10. System Development

System testing phase is the stage of testing the system by passing the test to users who use the system in the CV. Hilmi Jaya and conduct interviews to check the suitability of the system with the needs in the CV. Hilmi Jaya.

11. Conclution

This stage will be drawing conclusions on the system that has been built whether it is in accordance with the initial objectives of the study.

2. CONTENT OF THE STUDY

2.1.1 Theoretical Basis

Theoretical basis is a framework in the writing of scientific papers to explain the things that support in the development of scientific

work. The foundation of this theory supports in a study, then some of the following explanations support for the development of information systems product control in the CV. Hilmi Jaya uses Supply Chain Management Method.

2.1.1 Information System

Defining the system there are two groups of systems approach, the system is more emphasis on procedures and elements. The procedure is defined as a precise sequence of instruction steps that explain what to do, who does it, when it is done and how to do it. Based on the elemental approach is the system as the interconnected parts that operate together to achieve multiple goals or purposes. [2]

2.1.2 *Supply Chain Management*

Supply Chain Management is a method used to coordinate and collaborate between companies on a supply chain because companies that are in a supply chain essentially want to satisfy the same end consumer, they must work together to make a cheap product, deliver it on time, and with good quality [2].

2.2 Forcasting Techniques

Forecasting is an estimate or estimate the level of demand for a product or many products for a certain period of time. Forecasting is used to measure or assess future conditions. [5]

2.2.1 Single Moving Average Forecasting Method

Single Moving Average method is a forecasting technique based on the moving average of the past value. Single Moving Average formula is:

$$F_{t+1} = \frac{Xt+Xt-1+Xt-2+\cdots+Xt-N+1}{N} \quad (2.1)$$

Keterangan :

F_{t+1} : Forecasting value for period $(_{t+1})$

X_t : The actual value in the period $_t$

N : The amount of time in the moving average

2.2.2 Measurement Research From Forecast

Mean Squared Error (MSE) is another method for evaluating forecasting methods. Each error or residue is squared. Then summed and added with the number of observations. This approach sets the big forecasting error because the errors are squared. The method produces moderate errors that are likely to be better for small errors, but sometimes make a big difference.

The following are some measures used to calculate forecasting errors.

$$MSE = (\Sigma |Ft-Y|^2)/n \quad (2.2)$$

Keterangan :

Ft = Peride forecasting results to *t*

Y = The original data (real) period to *t*

n = Number of observation periods

Ft-Y = Forecasting error

2.3 System Analys

System analysis is a stage to study system interaction consisting of process actors in the system, procedures and related information in the CV. Hilmi Jaya. In the analysis of the system carried out the decomposition in detail to get the process of evaluation and identification of problems more focused and in accordance with existing needs.

Stages performed are system analysis, problem analysis, analysis of running procedures, business rule analysis, supply chain management system analysis, non-functional requirements analysis and functional requirements analysis.

2.3.1 Supply Chain Management Model in CV. Hilmi Jaya

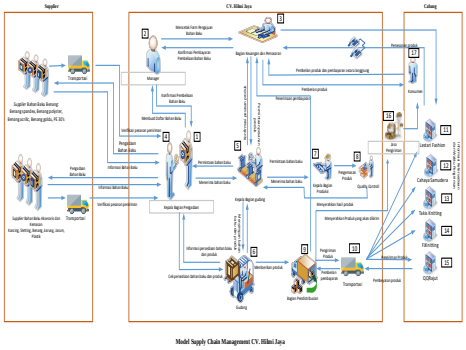


Figure 2 Supply Chain Management Model in CV. Hilmi Jaya

Description of the Supply Chain perpetrator shown in Figure 3.5. Supply Chain Management Model at CV. Hilmi Jaya is as follows:

CV. Hilmi Jaya using push supply chain approach or also called make to stock in production system that is by producing product before existence of order from consumer and to stock inventory in warehouse therefore production process at CV. Hilmi Jaya is strongly influenced by the availability of raw materials.

Stage in supply chain CV. Hilmi Jaya is started from the procurement of raw materials by way of the procurement head to confirm the purchase of raw materials to the manager, then

the manager will print the raw material form to the marketing department and confirm the payment to the manager and confirmed again by the Head of Procurement and order raw materials to produce the product has been submitted head of procurement to the manager. The ordered raw materials will then be shipped by the supplier directly to the knitting convection place to be produced according to the letters made by the manager.

CV. Hilmi Jaya has 2 categories of suppliers and 6 suppliers of raw materials for its production activities. Selection of suppliers based on products sold by suppliers and purchases with major suppliers first and who have worked with CV. Hilmi Jaya, 2 categories of suppliers are listed in Table 1.

Table 1 *Supplier Category of Raw Materials*

Supplier Category	*Nama Supplier*
1. Bahan Baku Benang	*1. CV. Kurnia Abadi*
	2. PT. Aneka
	3. CV. The Misshil
	4. CV. Federal
2. Bahan Baku Aksesoris dan kemasan	*1. CV. Daily Sletting*
	2. CV. Damar Suci

2.3.2 Supply Chain Management Phase in CV. Hilmi Jaya

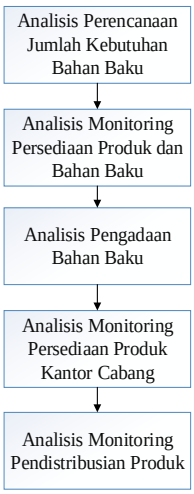


Figure 3 Supply Chain Management Phase in CV. Hilmi Jaya

1. Planning Analysis of Total Raw Material Needs

Calculation of forecasting required product sales data some previous period. The data to be sampled is the product with the highest number of requests for the period of March - August 2017 which is the type of black spandex cardigan product (Appendix of Black Selling Data of black spandex cardigan from March 2017 to August 2017). Recapitulation of sales data of black spandex cardigan product during March - August 2017 is described in Table 2.

Table 2 Recapitulation Of Product Data Cardigan Black Color Spandex Period March – August 2017

No	*Periode*	*Jumlah Penjualan*	*Satuan* **Pcs**
1	*Maret*	*279 lusin*	*3348 Pcs*
2	*April*	*224 lusin*	*2688 Pcs*
3	*Mei*	*226 lusin*	*2712 Pcs*
4	*Juni*	*244 lusin*	*2928 Pcs*
5	*Juli*	*330 lusin*	*3960 Pcs*
6	*Agustus*	*241 lusin*	*2892 Pcs*
Total		***1544 lusin***	***18528 Pcs***

Based on the data that has been described produce a graph to know the pattern of product demand data. It aims to know the method to be used in accordance with the pattern of data generated. The graph of product demand data can be seen in Figure 4.

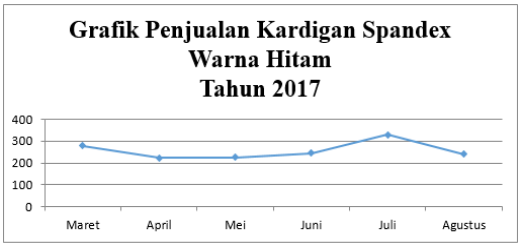


Figure 4 *Sales Graph of Cardigan Black Spandek Product Period March-August 2017*

2. Analysis of Inventory Monitoring of Products and Raw Materials

After conducting the forecasting stage, the next step is to monitor raw material inventory and determine the safe limit of raw materials that must be in the raw material that aims to avoid the occurrence of deficiencies or void raw materials using the method of Safety Stock.

3. Procurement of Raw Materials Analysis

Ordering suppliers include spandex anita 40/75, PE 30's thread, and black buttons. The procurement process is done in an agreed way of cooperation. When the raw materials that have been ordered to come will be handled by the procurement department The procurement department inspects the raw materials and will enter the raw material supply warehouse

4. Monitoring Analysis of Branch Office Supply Products

The branch monitoring stage is carried out to obtain information on product inventory at each branch office. By monitoring the inventory of branch offices CV. Hilmi Jaya can distribute the product without having to wait for a request first. This is done when the supply of products at the branch office is in the "Not Safe" indicator.

5. Analysis of Product Distribution Monitoring

Coverage in distribution activities include monitoring of products to be sent, monitoring of distribution status, distribution scheduling and vehicle capacity to be used in product distribution to Branch Offices. Monitoring distribution is done so that the product reaches the destination on time, monitoring the distribution status done to determine the distribution status of whether the product has reached the destination or still in the process of distribution. Distribution scheduling activities can be determined by looking at which product demand is ready to be distributed, then the company determines which vehicle will be used to deliver the product tailored to the capacity of the vehicle at the time of distribution.

2.4 Interface Implementation Login Page

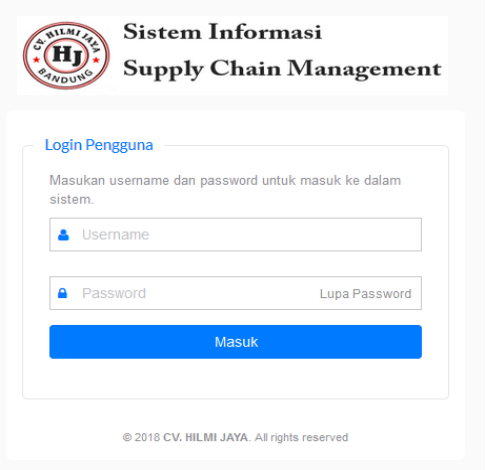


Figure 5 Interface Implementation Login Page

2.5 Interface Implementation Forgot Password

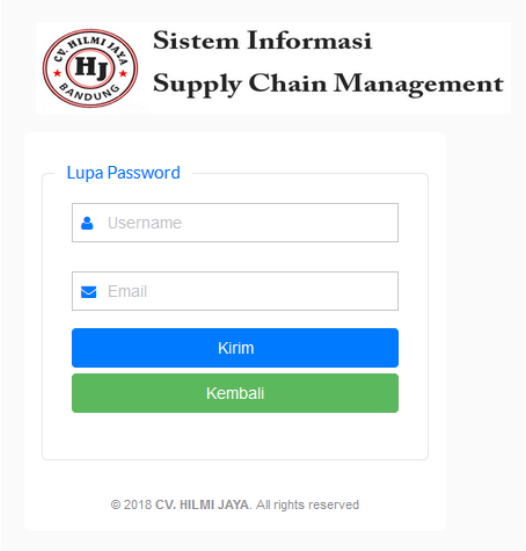


Figure 6 Interface Implemtation Forgot Password

2.6 Interface Implementation Admin Page

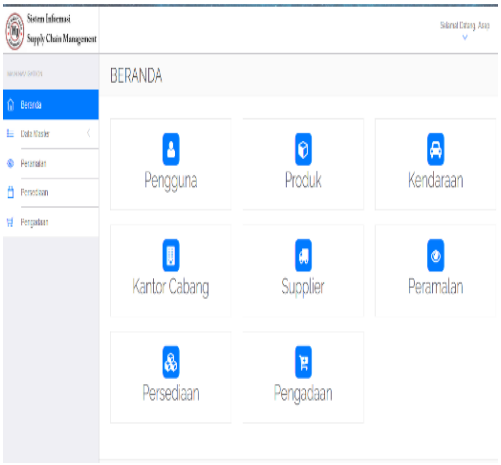


Figure 7 Interface Implementation Admin Page

2.7 User Interface Implementation View

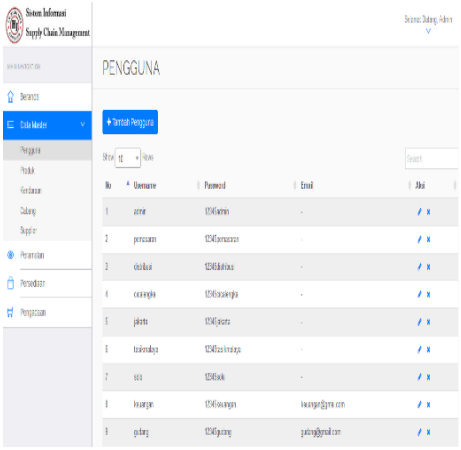
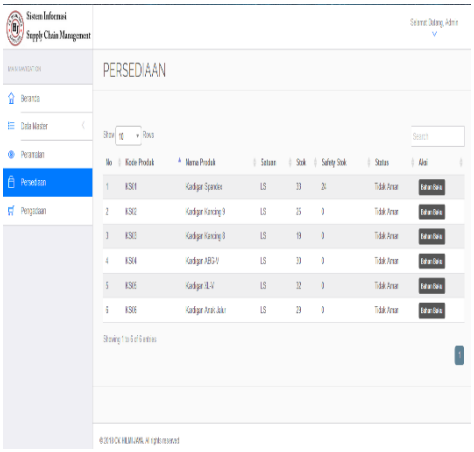


Figure 8 User Interface Implementation View



2.8 Conclusion Of Beta Test Result

Based on the results of interviews of each user or resource persons to the questions posed in the interview test can be concluded that the system built is user friendly, easy to use, assisting the Head of Procurement in determining the amount of raw material inventory to be ordered to suppliers, assist Manager in monitoring product inventory in each branch, and assist the Chief of Distribution in conducting monitoring of the distribution and distribution scheduling process that includes the date of distribution, the name of the sender, the amount of distribution, and the vehicle to be used, as well as assisting the Marketing, Finance and Marketing branch in the operational activities.

3 COVER

In this chapter will explain the conclusions that contain the results that have been obtained after the analysis, design, and implementation of software design that has been developed and developed and suggestions that will provide important records and possible improvements that need to be made to the development of the device software before.

3.1 Conclusion

After analyzing, designing, and testing with black box and beta method, it can be concluded as follows :

a. The system has been built to facilitate the procurement head in determining the amount of raw material needs to be ordered to suppliers.
b. This built system can make it easier for managers to monitor product inventory in every branch office.
c. The system has been built that can facilitate the Chief Distribution in monitoring the distribution process to each branch office.

3.2 Suggestion

The results that have been done to this final stage, there are some shortcomings. Suggestions along with feedback to add things that can complement the system of control of this transport field will come. Among others are:

a. Supply Chain Management information system at CV. Hilmi Jaya still needs to be improved in terms of appearance in order to facilitate the use of this system.
b. Supply Chain Management information system at CV. Hilmi Jaya can still be developed again.
c. Forecasting methods used in the system can be applied also in branch offices to facilitate Branch Marketing in determining the inventory needed to meet consumer needs.

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