DEVELOPMENT SUPPLY CHAIN MANAGEMENT IN CV. ALMOS

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ABSTRACT

This study aims to build a web-based software information system that will be used to replace manual systems running on the CV. ALMOS to forecast products and raw materials using single exponential smootering, monitoring, accepting ordering of stock products and custom products. Purpose and purpose of research to replace manual system at CV. ALMOS and facilitate employees on CV. ALMOS.

CV. ALMOS is a company that focuses on t-shirts production. The process that occurs is the general manager is still difficult to determine the delivery information to consumers so that information submitted to the general manager to the consumer is not appropriate, while the warehouse has difficulty in manentukan the amount of raw materials purchased to suppliers. The inability to estimate the raw materials to be purchased results in the deficiency of raw materials or excess raw materials resulting in buildup in the warehouse.

Based on current problems at CV. ALMOS, it needs a supply chain management system. The purpose of this SCM system development is to enshrine in deciding the shipping of custom product for general amanager and determining the amount of raw material purchased by the warehouse.

Keywords: Supply Chain Management, Single Exponential Smoothing, Safety Stock

1. PRELIMINARY

CV. ALMOS started business in early 2005 engaged in production and sales of Batak themed clothing, Rohani, Products produced CV. ALMOS is an adult-sized t-shirt. Product of clothes CV. ALMOS marketing products spread in Bandung, Pematangsiantar, Jakarta, Medan, Balige, Dolok bun, Batam, Tarutung. Based on the interview with Mr. Denal Naibaho as Owner that CV. ALMOS also accepts reservations from other agencies such as Companies, Schools, Communities. Mr. Denal Naibaho also explained about the business processes that occur in the company, CV. ALMOS has 5 suppliers with details of combed catton fabric, yarn, screen printing. CV ALMOS uses a strategy to wait for ordering product costum from consumers (make to order) and products that have been produced by the company (make to stock). On ordering process CV. ALMOS is done via email, telephone, or coming directly to the contents on weekdays. Delivery of products is done using 1unit car box, delivery service, taken directly by consumers. Raw material ordering to the supplier has a 3-5 day waiting time from starting the ordering of raw materials.

Based on interviews with mariaa ana mothers as production managers, stated that the production capacity in CV. ALMOS can only work on 400 Pcs for all types of products. For the costum product processing time required to do the same with the time required workmanship of stock products. the production process of stock products is preferred to meet the needs of stock products.

Based on the results of the interview to Mr. Al Fidaus, the general manager is still difficult to determine the information on the delivery time of the product costum due to the waiting time at the time of ordering of raw materials and due to the number of ordered costum products different - the amount and at the time of booking general manager must be

able to determine the delivery date impact on the misalignment of information submitted to customers.

Based on the interview with Mr. Ridho, the warehouse has difficulty in determining the amount of raw materials that will be reported to the general manager, because the warehouse calculates only raw material estimates based on the results of monitoring raw materials which have been used every week there is a vacuum and lack of raw materials to produce stock products. The company also does not directly feed raw materials after a vacuum of raw materials. The availability of finished products is strongly influenced by the availability of raw materials in the warehouse. The lack of raw materials impacted the production process inhibited.

Based on existing problems then CV. ALMOS requires the development of information systems to manage raw materials management, production and delivery, it is necessary development of supply chain management information system (SCM) in CV. ALMOS.

2. RESEARCH CONTENTS

2.1 Theoretical basis

2.1.1 Basic concept of the system

The basic concept of a system is a set or organization that is interconnected with one another and interdependent to create a common goal on a regular basis [1].
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2.1.2 Understanding Of system

Some understanding of the system according to experts as follows: [2]

1. According to Jerry FithGerald: the system is a network of interconnected procedures to perform an activity to solve a particular purpose.
2. According to Ludwig Van Bartalanfy: the system is a network that is bound to each other in a relationship between elements with the environment.

2.1.3 Bentuk Umum Sitem

The general form of a system consists of the input (input), process and output (output).

2.1.4 Sytem Characteristic

The characteristics of a system, namely [2]:

1. Component System (Component)

A system consisting of a number of components that work together to form a unity that can be transformed into sub-systems.

2. System Limit (Boundary)

A system that limits a system with other systems. Limitations of this system are used as a differentiator with other systems or subsystems.

3. External Environment System (Enviroment)

A system that can affect the operation of a system that is distinguished into a favorable and disadvantageous external environment.

4. System Liaison (Interface)

Systems that connect subsystems with other systems into one so that the source kesubsistem other. The system becomes the output of a system into inputs on other subsystems.

5. Input System (Input)

The system that becomes the source of energy that will be incorporated into the system. Input can be energy maintenance and energy that will be processed within the built system

6. System Output (Output)

A system that extracts information from input energy.

7. Processing System (Process)

The system that processes the input energy which will become the output energy of the system.

8. Goal (Object)

The system that will be the reference whether the input in accordance with the planned goals or information output in accordance with the purpose of operation..

2.1.5 Information system

According to Robert A. Leitch information system is a system that brings one information with other information with the necessary reports. Information systems have basic operations that collect, manage, store, and disseminate information. Information can be collected from within and outside [2].

2.1.6 Information System Objectives and Activities

The purpose of the information system is to support the operational process of an organization by performing routine recording which later the record can be

audited again in the future which will be able to be reviewed in case of error.

2.1.7 Supply Chain Management

Understanding the supply chain is a network of companies that jointly work to create and deliver a product into the hands of end users. These companies usually include suppliers, manufacturers, distributors, stores or retailers, as well as support companies such as logistics services [3].

Supply chain management according to Oliver & Weber in 1982 is a physical network, ie companies involved in supplying raw materials, producing goods, or sending it to end users, SCM is a method, tool, management approach. Thus, supply chain management is not only oriented to the internal affairs of a company, but also externally related to relationships with partner companies [3].

In a supply chain there are usually 3 kinds of flow that must be managed. First is the flow of goods flowing from upstream to downstream and third is the flow of information that can occur from upstream to downstream or vice versa.

If we can return to the definition of supply chain and supply chain management above then we can say in general that all activities are fabricated with materials, information, and money throughout the supply chain is the activities in covering SCM. When we refer to a manufacturing company, the main activities included in the SCM classification are [3]:

- Activity designing new products.
- Activities get raw materials.
- Activity planning production.
- Activities to produce.
- Activities to send.
- Product return management activities.

These six classifications are usually reflected in the division of departments or divisions of manufacturing companies [3].

2.1.8 Determination of Safety Stock

Safety stock is a stock that is prepared as a buffer to anticipate the difference between forecasting and actual demand between expected and actual delivery time, as well as other unexpected things. The amount of safety stock needed to meet the level of demand / specific needs can be determined through computer simulation or statistical methods. In the calculations required sample data about column penulan / usage and skeleton casting [4].

$$ss = Z_a . Sd (t + L)$$

Information:

L: Lead Time / Wait Time

Z_a: Data Validation Calculation Result

Sd: Standard Deviation

The value of the service level used in the calculation of this formula is the magnitude of the Z value of the expected percentage of service level [4]. .

2.1.9 Just in Time (JIT)

Just in Time was first developed in Japan by a Toyota company in the past decade and then adopted by bnayk manufacturing companies in japan and united states. Just in time is a management operation philosophy, that is resources, including pesonel materials, and facilities used in the current situation [5].

According Krismiaji ideas that support just in time is as follows [5]:

a. Simple is better.

b. Emphasis on quality and continuous improvement.

c. Maintain inventory that is a source of waste and ugly work is hidden

d. Any activity or function that does not add value should be omitted

e. Goods are produced when needed

f. Workers must be skilled and participate in improving product efficiency and quality.

The primary goal of just in time is to improve the productivity of the product or operating system by eliminating all kinds of activities that do not add value (waste) to a product [5].

2.1.10 Single Exponential Smoothing Method

According to Render and Haizer (2005), exponential smoothing is a moving average forecasting technique with weighting where data is weighted by an exponential function. Exponential smoothing is a moving average forecasting method with advanced weighting, naming is still easy to use. This method has very few records of past data. The exponential smoothing formula can be shown as follows [6]:

Information:

Forecast for period t + 1

Xt = The real value of period to t

a = weights indicating smoothing constants (0 <a <1)

Ft-1 = Forecast for period to t-1

This method requires an alpha value (a) as the value of the smoothing parameter. A higher ax value is given to newer data, so the appropriate nilail parameter a will provide the optimal forecast with the smallest error value [6].

2.2 Problem analysis

Problem Analysis is a set of problems that are summarized in data processing procedures in distribution system by applying Supply Chain Managament in CV. ALMOS. Analysis of problems that have been running on the CV. ALMOS is:

1. Warehouse is still difficult to determine the amount of raw materials to be ordered so that there are vacancies and shortcomings
2. General manager is still difficult to estimate the completion of product costum and information delivery product costum.

2.2.1 Analysis of Supply Chain Management Method

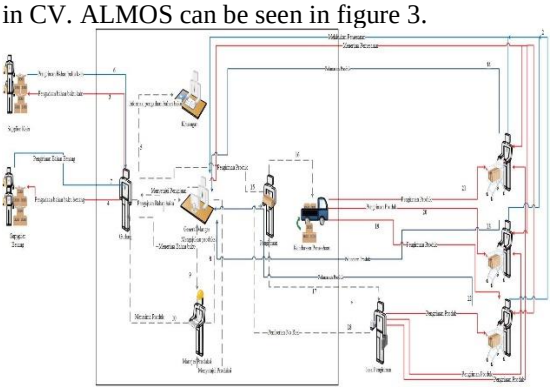
CV. ALMOS uses a make to order strategy that is the production process and purchase of raw materials at the time of ordering from consumers and CV. ALMOS also uses a make to stock approach where the company's production system will determine all products to be produced before adanaya order and production in the company is influenced by the existence of raw materials in the warehouse. There are two flows that occur in the CV. ALMOS is material flow and information flow. In the material flow there is a flow of raw materials and products for the flow of information there are raw material delivery flow, raw material delivery flow, product order flow from consumers and raw materials procurement flow. In this scope CV. ALMOS monitors the inventory of products to determine safe stock limit in the warehouse, inventory control in order to avoid void or stock shortage, monitoring product ordering CV. ALMOS can know the status of the order accepted or rejected, monitoring the distribution of the product. At the stage of monitoring the inventory of warehoused products using the method of safety stock to know the safe limit that must be available in the warehouse. The information for the procurement of raw materials using forecasting method in order to estimate the number of products ordered yag not exceed or not less.

Based on these flows and production systems in CV. ALMOS, it can be proposed to use supply chain management method on the system to be created. Supply chain management method has a framework that is a component of development on the system to be created.

CV. ALMOS has 6 suppliers to meet the raw materials, while CV. ALMOS has a consumer that is contained, Jakarta, pematangsiantar, terrain, balige, dolok bun, batam, tarutung.

2.2.2 Supply Chain Management Model in CV. ALMOS

Based on the description above supply chain management model contained in CV. ALMOS can be seen in figure 3.



Gambar 3. Model Supply Chain Managemen CV. ALMOS

2.2.3 Stages of Supply Chain Management

The information system of SCM approach strategy that will be built has several stages can be seen in figure 4.

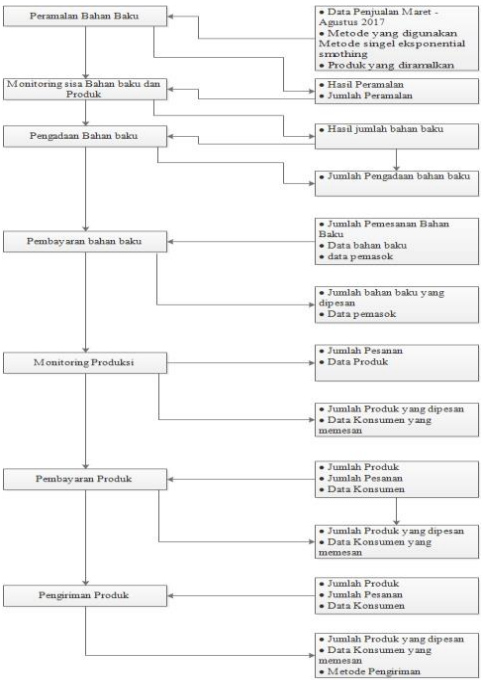


Figure 4. Stages of SCM Approach in CV. ALMOS

1. Forecasting stage

At the stage of forecasting CV. ALMOS has product demand data by the data cosum used to predict for raw material procurement in the next month data request used 6 months earlier and method used Single Exponential Smooting Method. Scheduling forecasting using just in time methods can be used to estimate the completion of production

2. Stage monitoring of raw materials and products

The company conducts monitoring of warehoused inventory and determines the safety limits by using safety stock in addition the company will perform product inventory control in order to avoid shortage / void stock in the warehouse.

3. Stages of procurement of raw materials

The Company will place the order of raw materials based on the result of forecasting data.

4. Stages of payment of raw materials

This stage where the company will determine the amount of raw ordered to the supplier and the financial section will issue the cost of ordering raw materials in accordance with the amount already ordered by the warehouse.

5. Stages of Production Monitoring

This stage where the company will record the work done that will be delivered.

6. Stages of product payment

The stages in which the number of products and consumers are determined by the company based on the ordering data and will be reported to the finance to determine the cost based on the data that has been determined

7. Delivery stages

The Company will deliver the goods based on forecasting results using just in time and adjusting orders based on order data.

2.2.4 Analysis of data dictionary

This analysis is a collection of interconnected data and data-data that will be used for the manufacture of information system software with supply chain management approach. The model used in designing the database is Entity Relationship Diagram (ERD). ERD which will be used CV. ALMOS seen in figure 5.

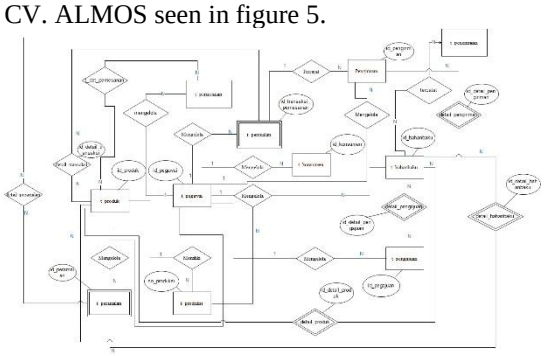


Figure 5. Entity Relationship Digram of Supply Chain Management (SCM) in CV. ALMOS

2.3 Context Diagram

Context Diagram explains thoroughly how the flow of data and information input and output running on the system to be built. Figure Context diagram on the system to be built on the CV. ALMOS can be seen in figure 6..

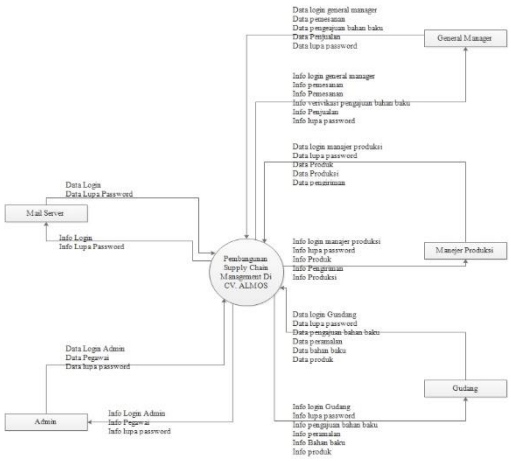
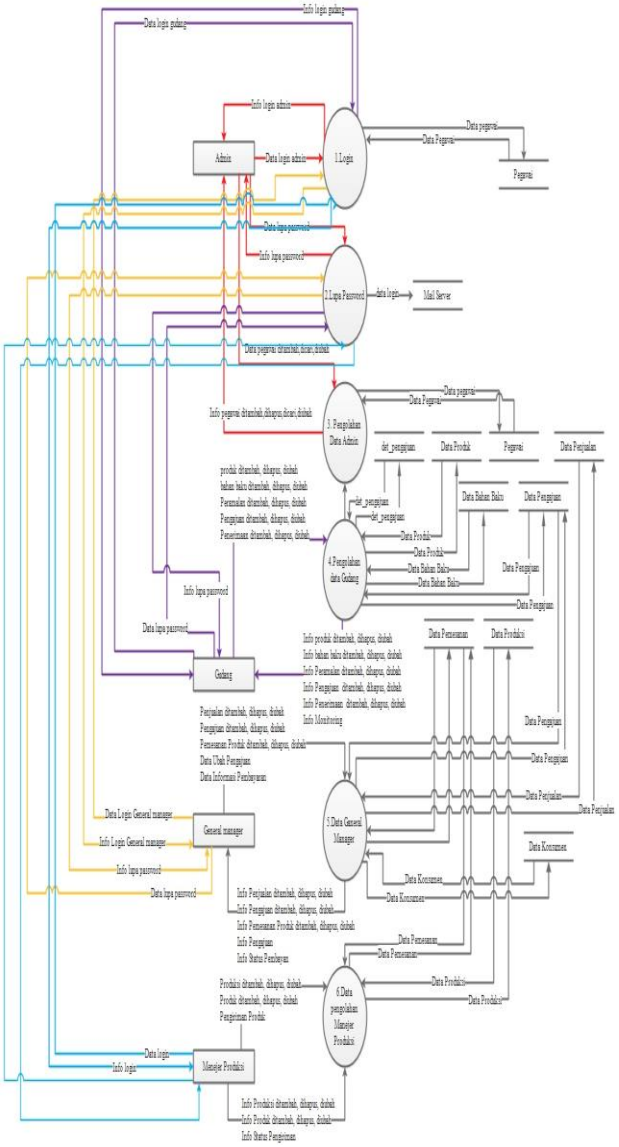


Figure 6. Context Diagram Of Supply Chain Management Development at CV. ALMOS

2.4 DFD (Data Flow Diagram)

Data flow diagram shows the flow of data that occurs on the system and processes - processes that occur in the system summarized into more detail. The processes are downgraded to some level until they find a level where the process becomes more detailed or can no longer be derived. DFD will be explained starting from level 1. Level 1 DFD can be seen in figure 7.

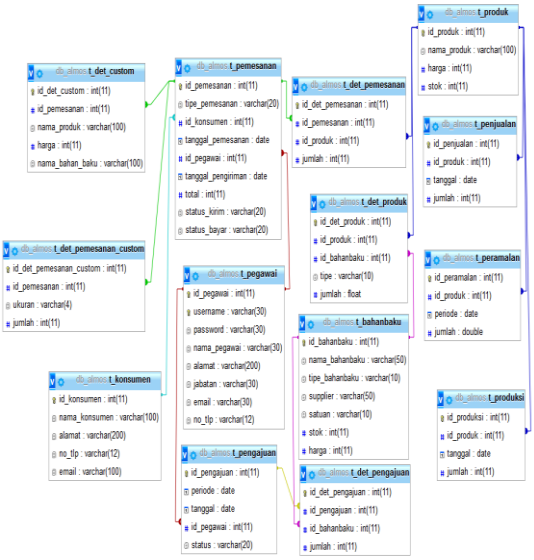


Picture 7 DFD Level 1 SCM Development at CV. ALMOS

2.5 Relation Scheme

An overview of the relationships between data. The process of data attribute relation that has the same primary key that will be linked through the lock field. Relation scheme picture can be seen in the picture

8.



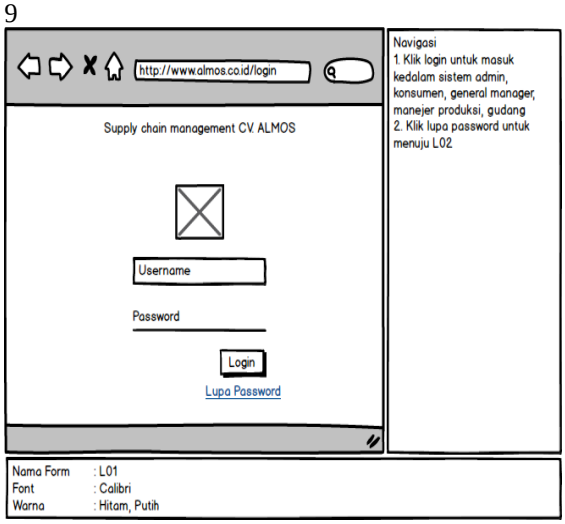
Picture 8 Relation Scheme

2.6 Interface Planning

The design of the interface to describe the appearance of the program that will be used by the user to interact on the program to be built. Stacking the system to be built will be implemented in the application. The design of supply chain management interface in CV. ALMOS as follows:

1. Login Interface Design

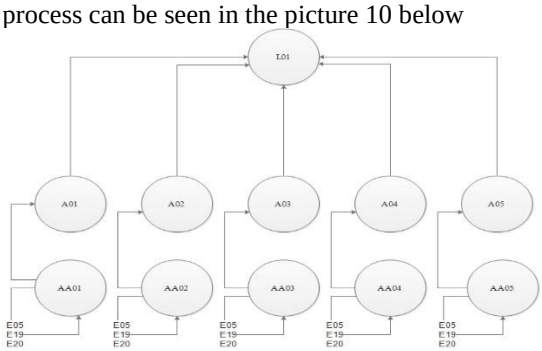
The design of the login interface will be used by the admin, general manager, production manager, warehouse, consumer function to login. The design of the login interface can be seen in Figure 9



Picture 9 LoginLogin

2.7 Semantic Network

Semantic network is the design of the network - the network that will connect the menu - the menu will be accessed by users of software systems to be built each process can be seen in the picture 10 below



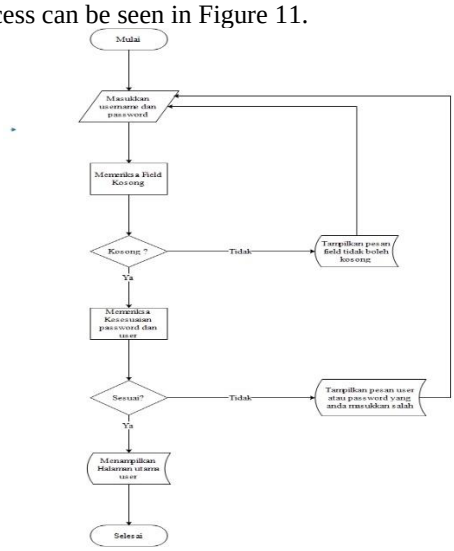
Picture 10 Semantic Network Admin

2.8 Procedural design

The procedural design changes the structural elements of the program architecture into procedural use of software components. The procedural design of the application to be built as follows:

1. Procedural Login

Login process occurs when the user opens the main page on the system to be built. Users are required to login to be able to enter into the system to be built. The login process can be seen in Figure 11.



Picture 11 Procedure Login

2.9 Testing system

Testing the system is a process of running a device system built in accordance with the desired design or function. System testing is often used as searching for bugs, program code errors that lead to system software failures.

Software testing uses blackbox testing. Black box testing to test the needs of programs that have been planned is met. Blackbox testing is done by executing the unit in accordance with the planned process

2.9.1 Blackbox Testing Plan

Blackbox testing plan is used to describe the testing of a running system by testing software functions sequentially on supplay chain management information system in CV.

2.9.2 Beta Testing Scenario

Beta testing is done by observation directly at the research site by using a cosioner or interview from the place of research by asking the following questions:

1. Interview questions to Mr. Al Fidaus as general manager consists of:
   a. Does this system help you to deal with more accurate delivery of filling information?
   b. How do you think about using this system?
   c. What are your suggestions going forward for this system much better?

3. CLOSING

This chapter describes the results of research obtained through analysis, implementation, design of information systems built in CV. ALMOS. And the researchers will provide suggestions that will later enable the improvement that needs to be done for software development better than everab ini menjelaskan hasil dari penelitian yang diperoleh melalui analisis, implementasi, perancangan sistem informasi yang dibangun di CV. ALMOS. Serta peneliti akan memberikan saran-saran yang akan nantinya memungkinkan adanya perbaikan yang perlu dilakukan untuk pengembangan perangkat lunak yang lebih baik dari sebelumnya

3.1 Conclusion

Based on the results of research obtained in writing the final tugask can be concluded as follows:

1. Helping the general manager deliver the shipping information to the customer and the time of completion of the costum product
2. Facilitate the warehouse to determine the amount of raw materials to be submitted to the general manager to meet the needs of production stock on the production

3.2 Suggestion

Based on the results of research as for the suggestions gained for the development of supply chain management information systems in CV. ALMOS as follows:

1. Need the development of appearance and interconnection between parts because in some parts still there is information that must be submitted manually.
2. The need for information systems between suppliers and companies is expected to get raw material information faster than before..

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