DEVELOPMENT OF SUPPLY CHAIN MANAGEMENT INFORMATION SYSTEM IN AA TEKNIK

Mohamad Saeful Ihsan[1], Ir.Taryana Suryana, M.Kom.[2]

[1.2]Information Engineering - University Computer Indonesia
Jl. Dipatiukur 112-114 Bandung
Email: mohamadihsan@katapanda.com[1],taryanarx@gmail.com [2]

ABSTRACT

CV AA Teknik, is a company engaged in the production of gas tube seal water pumps and spare parts. The production of products derived from the basic raw material of rubber and plastic. The problem faced by companies that delay the provision of raw materials for the production process due to take place several times a delay in the delivery process of the supplier and the company does not keep a stock of raw materials in the warehouse due to excess capital to purchase raw materials considered quite large. This causes the production process and product delivery late. Another issue is the difficulty in scheduling deliveries to customers due to the lack of management information, especially regarding the availability of raw materials.

One way to help companies solve the problem by building a system that can manage its information supply chain¬. Therefore, Supply Chain Management (SCM) is the right choice to handle these problems because the function itself is integrating processes - business processes ranging from raw material suppliers to the end users. The method used in the system is built is the method of Just In Time (JIT) so that the raw material needs are met in a timely and appropriate amount as needed for the production process.

Keywords : Supply Chain Management (SCM), Just In Time (JIT), Information Systems

1. INTRODUCTION

CV. AA Engineering is a company engaged in the production of seal gas cylinders and various spare parts electric water pump. Products in the production of basic raw materials derived from rubber compounds and plastic compounds. CV. AA Teknik has 9 kinds of products are produced, namely red seal, black seal, seal orange, tabak hanil, o'ring, tabak national, toris nuts, nut 1/2 and hubcaps.

Another problem that occurs in the company is not a stock of raw materials in the warehouse, is due to the capital to purchase raw materials deemed big enough and yet again there will be the cost of storage. Therefore, the amount of raw material ordering is usually calculated to match the amount of product orders from customers. It is sometimes difficult for him because it must calculate required every time there ordering products. He said that until now, the delivery of raw materials from suppliers to the company have also been several delays because of the queues at the booking party supplier. Usually within three days of raw materials ordered have arrived, but if there is a delay usually up to four or five days. This becomes a problem for inventory division, because the raw materials are not available in a timely manner in the barn have an impact on the production process. The production process is delayed causing the product delivery process to the customer would be much longer.In this case, part of Marketing experience problems in determining the scheduled delivery of products to customers is currently empty raw materials and delayed delivery. Marketing Department must communicate with inventories division for the old ordering raw materials and communicate well to the production section to determine the length of the production. Lack of information leads to the management of part of Marketing difficulty in determining when delivery of the product to do and also the difficulty in resetting the date of delivery of products to customers who have made reservations. Shipping information Marketing department to customers sometimes do not match.

The purpose of this study, for information systems Supply Chain Management at CV. AA Engineering. While the purpose of the research is as follows:

1. Help inventories division in the purchase of raw materials to the supplier that the raw materials ordered can be met in a timely manner and in accordance with the amount needed for the production process.
2. Assist Marketing department in determining the schedule of distribution or delivery of products to any customers who have placed orders for products, thereby reducing errors in the provision of information delivery.

2. CONTENTS OF RESEARCH

2.1 Supply Chain Management

Supply Chain is a series or network of companies that work together to create and distribute the products or services to the end consumer. In the supply chain there are three streams entity to be managed well, namely material, information, and finance. Another understanding of Supply Chain Managmenent (SCM) is the management of information, goods and services ranging from the earliest suppliers to the end consumers by using integrated systems approach with the same purpose. [2]

2.2. Push and Pull Supply Chain Management

Pull Supply Chain is a production strategy "make-to-order" the main benefit is to avoid waste inventory or a company's strategy is mainly a manufacturing company where the new production is done always after the market demand and actually performed at the request of customers. The disadvantage of this strategy is the waste of time in meeting customers' needs for the stock-out or out of stock so the company must produce a product first.

Push Supply Chain is a production strategy "make-to-stock". This strategy is the opposite of a pull strategy, in which the push strategy is more popular due to its production system based forecasting and produce output in large numbers will be entered into the inventory before it is piped to customers.

Push-Pull Supply Chain is a strategy that uses the approach between the push and pull, and then it is known as the push-pull boundary. In practice, the push is part of supply chain management at the time prior to production, while the pull starting of production based on demand or customer orders.

2.3. Just In Time

Just In Time (JIT) is a problem-solving philosophy closely and continuously to eliminate waste-waste and irregularities that are not expected. JIT itself is a production philosophy developed by Toyota Motor, which managed to make the automotive industry and electronics industry japan be able to work efficiently with good output quality. Japanese industry could shift by taking market share of the automotive and electronics that had been dominated by European Countries and the United States.

According to Yamit, "Just In Time" is the efforts to eliminate the waste in all areas of production, so as to result in a final product and deliver timely untu sold [5].

Meanwhile, according to Heizer and Render, "Just In Time" is a philosophy of continuous problem solving and force that supports lean product (lean). Lean production (lean production) supplying customers exactly according to the wishes of customers when the customer wants it, without waste, through a sustainable improvement [6].

The main objective of the implementation of JIT in general are as follows [5]:

1. Zero Defects (Eliminate defects)
2. Zero Inventories (Negate inventory in the factory)
3. Zero Setup Time (Negate preparation time)
4. Zero Handling (Negate material handling)
5. Zero Queues (Negating the queue)
6. Zero Breakdowns (Negate damage to the machine)
7. Zero Lead Time (Negate timeout)
8. Zero Lot excesses (Negating the excess lot)
9. Zero Schedule Interuptions (Negate interference with the production schedule)

Adapaun difference between pemanufakturan Just In Time with traditional pemanufakturan according Supriyono is as follows [7]:

table 1, Just In Time Difference Method and Traditional

Distinguishing factors	Just In Time	Traditional
characteristics	Pull-through system	Puss-through system
inventory quantity	a little	Many
structure of manufacturing	cell manufacturing	Structures Department
Qualifying labor	multidisciplinary	Specialist
quality Policy	quality control	Tolerance defective products
facility services	Spread	centralized

2.4 User Acceptance Test (UAT)

The new application is built to be tested for compliance and reliability through the test UAT (user acceptance test) as a condition that the application has to be accepted by the user / consumer. UAT can be said as a test of finding defects (defects) that can not be found by the developers [15]

2.5 Problem analysis

Problem Analysis is an assumption of the issues that will be described in the data processing procedures in a development program Information Systems Supply Chain Management at CV. AA Engineering. Analysis of problems of the current system at this time is:

1. CV. AA Teknik does not store excess stocks of raw materials in the warehouse, is due to the capital to purchase raw materials deemed big enough and yet again there must be other costs such as the costs of storage. Total ordering raw materials are usually calculated to match the amount of product orders. It is sometimes difficult because part Inventories should calculate the amount of raw material needs to be purchased to the supplier whenever there ordering products from customers. Delivery of raw materials from suppliers to the company to date has also happened several times due to delays in the ordering queue supplier. Therefore, if this continues to happen, it will have an impact on the company due to the raw materials that are not available in a timely manner in the warehouse led to the production process too late. If the production process is delayed, then the process of shipping products to customers would be much longer.

2. Lack of management information, especially regarding the availability of raw materials, leading to difficulties in determining the Marketing department or rearrange schedules are shipping products to customers upon delivery of materials has been delayed so that the Marketing sometimes make mistakes in providing shipping information to customers. If this continues to happen will certainly have an impact on customer satisfaction to be reduced and ultimately will hurt the company.

2.6 Analysis of Supply Chain Management at CV. AATeknik

Analysis of supply chain CV. AA Teknik in this study will be conducted with the approach of Just In Time. The analysis of the supply chain - it can be seen in Figure 1.

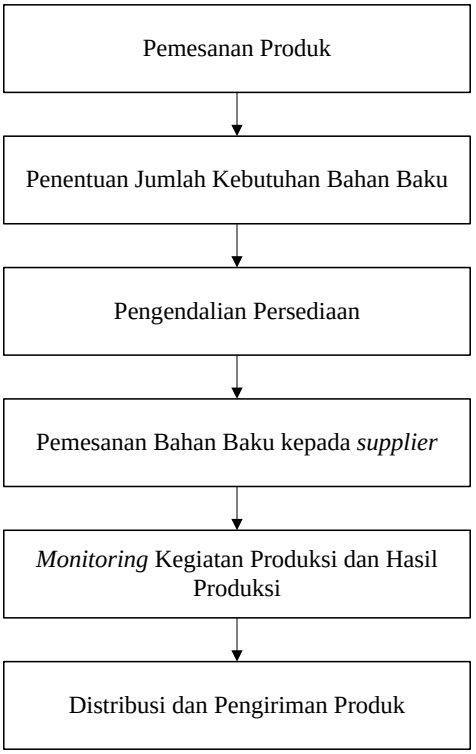


Figure 1, Supply Chain Management at CV. AA Engineering

1. Ordering Products

Product order is the beginning of the supply chain activities in the CV. AA Engineering. In this process, the customer will order the products and confirmation of payment.

Here is an example of ordering products from three customers who order products on the same date, ie on February 5, 2016 to CV. AA Engineering. The first customer, Mr. Jaya from Malang ordered red seal as many as 100 thousand pieces, namely Mr. Abdullah customers both from East Java Kertasono red seal product ordering as many as 50 thousand pieces and a third customer, Mr Kris from Surabaya ordered black seal as many as 100 thousand pieces. The third customer pays his order on the same day with the first payment order is Mr. Jaya, Mr Abdullah and Mr Kris. Storage conditions in an empty state, namely the unavailability of products and raw materials. Details of the reservation data can be seen in Table 2.

table 2, Data Ordering Products

Tanggal Pemesanan	Pelanggan	Nama Produk	Jumlah (buah)	Total (buah)	Waktu Pembayaran	Kota
5 Februari 2016	Bpk. Jaya	*Seal* Merah	100.000	150.000	5/12/2016 09.00	Malang
	Bpk. Abdullah	*Seal* Merah	50.000		5/12/2016 11.00	Jawa Timur
	Bpk. Kris	*Seal* Hitam	100.000	100.000	5/12/2016 14.00	Surabaya

The data will be used as an example to undertake further analysis of the supply chain.

2. Determination of Total Raw Material Needs

This stage is carried out in order to determine the amount of raw materials needed for each order product. At this stage will be calculated for any raw materials that will be used to make the product and how much of the raw materials needed to make these products.

Based on data from bookings, Mr. Jaya and Mr Abdullah ordered the same product that is a red seal. Therefore the calculation of its raw material needs can be counted once. Here is the calculation of required raw materials to produce the red seal on the order Mr. Jaya and Mr Abdullah.

a. Raw material requirements DM Compound 35/40

$$\text{jumlah bahan baku} = \frac{X_{\text{pemesanproduk}} \text{ x komposisi}}{X_{\text{produksi}}}$$

$$= \frac{150.000 \text{ buah x } 0{,}5 \text{ kg}}{1000 \text{ buah}} = 75 \text{ kg}$$

b. Raw material requirements of silicone oil

$$\text{jumlah bahan baku} = \frac{150.000 \text{ buah x } 0{,}1 \text{ Liter}}{1000 \text{ buah}} = 15 \text{ Liter}$$

So even calculating raw material requirements needed to produce a black seal to order Mr Kris can use the same formula as the previous calculation is as follows:

a. Raw material requirements DM Compound 35/40

$$\text{jumlah bahan baku} = \frac{X_{\text{pemesanproduk}} \text{ x komposisi}}{X_{\text{produksi}}}$$

$$= \frac{100.000 \text{ buah x } 0{,}5 \text{ kg}}{1000 \text{ buah}} = 50 \text{ kg}$$

b. Raw material requirements of silicone oil

$$\text{jumlah bahan baku} = \frac{100.000 \text{ buah x } 0{,}1 \text{ Liter}}{1000 \text{ buah}}$$

$$= 10 \text{ Liter}$$

Based on the calculation of raw material requirements for product orders and seal red seal black, then the CV. AA Teknik requires raw materials for the booking of Mr. Jaya Mr Abdullah and Mr Kris are: Compound DM 35/40 as much as 75 kg, Compound 35/40 DFRS as much as 50 kg, and Silicone oil as much as 15 + 10 = 25 liters.

table 3, Total Raw Material Needs

Raw material	amount
DM Compound 35/40	75 kg
DFRS Compound 35/40	50 kg
Silicone Oil	25 liter

Policies in the Just In Time system, the company needs to make a reservation of raw materials to suppliers based on Table 3.9. However, in practice there are some products that are defective due to the fault of the pencetakkan process or the cutting process. By using the Just In Time system companies need to improve both the source of the problem in the quality of labor, especially the production or of the state of the machine. Employment in the Just In Time trained to be skilled double, so that experts in production. In the system of Just In Time, too, the problem would be tolerance of product defects later exaggerate cope with ordering raw materials, it is advisable not to do anymore due to the overhead of ordering raw materials, it will cause the cost of inventory or larger orders.

3. Inventory control

The company's policy in ordering raw materials are adding 4% of the booking amount. It can be used as a minimum inventory of raw material inventory. If the company has made improvements such as the explanation in the preceding stage so that the possibility of no occurrence of product defects, the supply of raw materials in the warehouse could be pushed back to a minimum so that the cost of inventory can be smaller.

In a system built, the system will recommend whether the company needs to increase the amount of raw materials as much as 4% when booking or do not need (to follow the JIT system). On a case by ordering products in Table 3.2, the system can be recommended for ordering raw materials to overbid as much as 4%. This is because at present, the company has not introduced a system of JIT and also the status of the warehouse is empty. Hence the excess raw material that will be used as the minimum threshold of inventory as well as in accordance with company policy. Here is the calculation for the case of booking in Table 3.2 by adding 4% of the total raw material requirement in Table 3.9 by using equation (2.2).

a. DM Compound 35/40
   Total bookings = 75 kg x 4% = 3 kg
   Recommendations for reservations compound DM 35/40 is 75 + 3 = 78 kg.
b. DFRS Compound 35/40
   Total bookings = 50 kg x 4% = 2 kg
   Recommendations for reservations DFRS compound 35/40 is 50 + 2 = 52 kg.
c. Silicone Oil
   Total bookings = 25 kg x 4% = 1 liter
   Recommendations for booking silicone oil is 25 liters + 1 liter = 26 liter.

Based on the calculations have been done, then the recommendation amount of raw material ordered to the supplier, can be seen in Table 4.

table 4, Recommendation number ordering raw materials

Raw material	Total Requirements	Once added 4% of the needs of
DM Compound 35/40	75 kg	78 kg
DFRS Compound 35/40	50 kg	52 kg
Silicone Oil	25 liter	26 liter

4. To make a reservation Raw Materials Supplier

In the system of Just In Time the number of suppliers should be little, then there is the closeness and always wanted to do business with the company. At this time CV. AA Teknik does not undertake any cooperation with the suppliers. But CV. AA Teknik, commonly subscribed to by one of the suppliers is by Titian PT Anugerah Agung. Therefore, it is advisable to CV. AA Technical cooperation long-term contract with suppliers in order to establish a mutually beneficial relationship in order to have a supplier who can supply valuable raw material cost, high quality, timely delivery and appropriate amount.

Here is a comparison calculation for the purchase of raw materials at the moment or as recommended if buying to suppliers that exist in the following table.

a. Primary PT.Kakada

table 5, Total Cost of Purchase in PT.Kakada Primary

Raw material	Price (USD)	Total requirement	Sub Total (USD)
DM Compound 35/40	13,200	78 kg	1.0296 million
DFRS Compound 35/40	8,800	52 kg	457 600
Silicone Oil	56,000	26 liter	1.456 million
		Total cost	**2.9432 million**

b. PT.Bigo Kingdom

table 6, The total cost of purchases in PT.Bigo Kingdom

Raw material	Price (USD)	Total requirement	Sub Total (USD)
DM Compound 35/40	13,500	78 kg	1.053 million
DFRS Compound 35/40	9,000	52 kg	468 000
Silicone Oil	56,000	26 liter	1.456 million
		Total cost	**2.977 million**

c. PT. Titian Anugrah Agung

table 7, The total cost of purchases in PT. Titian Anugrah Agung

Raw material	Price (USD)	Total requirement	Sub Total (USD)
DM Compound 35/40	13,200	78 kg	1.0296 million
DFRS Compound 35/40	8,800	52 kg	457 600
Silicone Oil	56,000	26 liter	1.456 million
		Total cost	**2.9432 million**

The comparison is based on Table 3.13, Table 3.14, and Table 3.15, obtained a total minimum cost of Rp.2.943.200 namely PT Kakada Pratama and PT Anugerah Agung Titian. There are two suppliers who have a minimum total cost of the same. If there is a case like this, the system will recommend suppliers often supply the raw material based on booking data earlier. Due CV. AA Teknik is often bought in Titian PT Anugerah Agung, the purchase of raw materials will be made to the supplier.

The following is a calculation of the cost of raw material ordering if CV. AA Mechanical run JIT system by not overstate the number of bookings and the company only buy raw materials in accordance with the number of requirements to fulfill product orders

table 8, Total Cost of Purchase in PT.Titian Anugrah Agung with JIT system

Raw material	Price (USD)	Total requirement	Sub Total (USD)
DM Compound 35/40	13,200	75 kg	990.000
DFRS Compound 35/40	8,800	50 kg	440,000
Silicone Oil	56,000	25 liter	1,400,000
		Total cost	**2.83 million**

Based on the calculation of the total cost in advance, it can be concluded that the total cost of the booking by using the company's policy at the moment is Rp.2.943.200 and the total cost of the booking system JIT is Rp.2.830.000. The difference in cost is Rp.113.200 reservations.

5. Monitoring Event Production and Production

Process monitoring of production activities and products aimed to monitor whether the production activities in the CV. AA Mechanical is running or not and monitor how many products have production and when each order can be completed. Parts involved in this process is a part of Production.

Calculations for long production can use the formula in equation (2.4) and equation (2.5).

$$\text{jumlah produksi/hari} = \text{jumlah produksi}_{\text{per jam}} \text{ x banyak mesin x t}$$

= (1 hour / (1 piece x 0,03menit / 60min)) x 4 x14 machine hours
= 2000 pieces / hour x 14 hours x 4 engine
= 112,000 pieces / day

$$\text{lama produksi} = \frac{\text{jumlah pemesanan produk}}{\text{jumlah produksi/hari}} = \frac{100.000 \text{ buah}}{112.000 \text{ buah/hari}} = 0{,}893 \text{ hari}$$

The company's production time per day is 14 hours, then 0,893 days is equal to 0.893 x 14 hours = 12.5 hours (12 hours 30 minutes). If production begins at 07.00, the orders of Mr. Jaya approximately completed on February 8 at 07.00 + 12 hours 30 minutes = 19:30.

Based on these calculations, that booking a red seal of Mr. Jaya workable for 12.5 hours. Due to the company's production time is 14 hours, the remaining time can be used for the production process product orders for the next 1.5 hours in the day.

The next order is a red seal of Mr. Abdullah as many as 50,000 pieces. Mr Abdullah ordered products together with products ordered Mr. Jaya, then the calculation is the same as the previous calculation. So many red seal products which can be produced in the remaining time of 1.5 hours with 4 pieces of the machine is 12,000 pieces. Because the production time of the day is up, and the number of orders Mr Abdullah has not been met, then the production process will be continued tomorrow.

The rest were to be manufactured is 50000-12000 = 48,000 pieces.

$$\text{lama produksi} = \frac{48.000 \text{ buah}}{112.000 \text{ buah/hari}} \text{ x 14 hours} = 0{,}429 \text{ hari}$$
= 6 hours

If the production process starting from 07.00 then around 13:00 on February 9, 2016 Mr. Abdullah orders already completed and in production. Monitoring process is known is the product that is being produced, the amount of which should be in production, the excess or leftover product that should be in production, the production time each order is completed, and the status of production activities. Based on product orders, monitoring the activities of production and yields can be seen in the following.

table 9, Monitoring Production Activities

No Pemesanan	Waktu Selesai	Produk	Jumlah yang harus di produksi	Hasil Produksi	Selisih	Status Produksi
INV-20160205-1	8 Februari 2016 19.30	*Seal* Merah	100.000 buah	0 buah	100.000 buah	Sedang Berjaan
INV-20160205-2	9 Februari 2016 13.00	*Seal* Merah	50.000 buah	0 buah	50.000 buah	Menunggu
INV-20160205-3	10 Februari 2016 11.30	*Seal* Hitam	100.000 buah	0 buah	100.000 buah	Menunggu

table 10, Production Activity Monitoring with Different Status

No Pemesanan	Waktu Selesai	Produk	Jumlah yang harus di produksi	Hasil Produksi	Selisih	Status Produksi
INV-20160205-1	8 Februari 2016 19.30	*Seal* Merah	100.000 buah	100.000 buah	0 buah	Selesai
INV-20160205-2	9 Februari 2016 13.00	*Seal* Merah	50.000 buah	30.000 buah	20.000 buah	Sedang Berjalan
INV-20160205-3	10 Februari 2016 11.30	*Seal* Hitam	100.000 buah	0 buah	100.000 buah	Menunggu

6. Distribution and Product Delivery

In the analysis phase product delivery will be conducted to determine the date when delivery of the product to do, while the distribution phase will be the determination of whether a customer orders a product with other customers who could be sent together or not. At this stage of transportation will also be determined what will be used.

a. Determination of Product Delivery Date

Here's an example of the calculation date of delivery by ordering products from Mr. Jaya, where the production time for orders is 12.5 hours that is considered 1 day.

$$T_p = T_{\text{pemesanan}} + (\text{lama pemesanan bahan baku} + \text{lama produksi})$$

= February 5, 2016 + (3 days + 1 day)
= February 5, 2016 + 4 days

= February 9, 2016

Based on these calculations, product orders for Mr Jaya will be delivered on February 9, 2016.

b. distribution Products

Freight car capacity the company can accommodate a load of about 700 kilograms. Products CV. AA Mechanical transported by wrapping sacks, where the weight for 1 sack containing about 35 kilograms of the product and the product seal gas tube in 1 sack containing 50,000 thousand pieces. Delivery of products will be carried out before 16:00.

Based on the calculation of production time on the previous stage, Mr. Jaya orders completed on February 8, 2016 at 19:30 and order Mr Abdullah was completed on February 9, 2016 at 13:00. Orders Mr Jaya has exceeded the delivery deadline is exceeded at 16.00 so that its order will be shipped the next day, ie on 9 Februrari 2016. Based on the production data, order Mr. Jaya and Mr Abdullah could possibly be transmitted simultaneously because they are on the same pengirimanan. It should be calculated again, whether the capacity of the car transport companies can send two orders simultaneously or not.

Based on the order data **Error! Reference source not found.**, Total product orders Mr Jaya and Mr Abdullah is 150,000 pieces of red seal. The total order if it has been wrapped in a sack is:

Number of sacks of fruit = 150,000 / 50,000 pieces
= 3 sacks
(3 sacks x 35kg = 105 kg)

Based on these calculations, that the load capacity for the delivery of orders Mr. Jaya and Mr Abdullah is 105 kg lighter than the load capacity of freight cars that can accommodate about 700 kg. The purpose of the second delivery order is Malang and East Java. Therefore, the system can recommend to its distribution process will be shipped by rail shipment due to being out of town and sent along to the station. This system can provide recommendations based on the destinations that are out of town, and the product can be completed before 16:00.

2.7 Functional testing

Functional testing using black box method is focused on the functional requirements of the system built. Black box testing scenarios for supply chain management information system in CV. AA Engineering

Based on test results with sample test cases that have been done, didapt conclusion that the processes on the system are correct. Filtering processing errors in the form of user interface is enough mkasimal. Functional systems can already produce the expected output.

2.8 Testing User Acceptance Test

Applications built to be tested through the test UAT (User Acceptance Test) as a condition whether the system is built has been accepted by the user. UAT can be regarded as a new test to find the defect that was not found by the developer. The testing process involves several employees CV system. AA Teknik that will be users of the system, including managers, secretaries, division of supply, production, marketing department, and the administration and finance

Based on the results of testing User Acceptance Test was done to the system is built, it can be concluded that the system had to be accepted by any user in the CV. AA Engineering.

2.9 Beta testing

Beta testing is a test that is directly in the actual environment. Users make an assessment of the system by the interview method. The results of the interview can be used to meraik conclusion whether the system has been built in accordance with the purpose or not.

Interviews were conducted for users of the system in CV. AA Teknik which comprises the heads, secretaries, supply division , production, marketing department, and administration and finance.

Based on the beta testing has been explained before it can be concluded that:

1. Supply chain management information systems help supply division, production, marketing department, management, secretarial, administration and finance in doing their respective duties.
2. The system is built fairly easy to use, but inventory division and production division were advised to make a guide on how to use the application.
3. The system is built has a fairly simple interface, nice and quite interesting.
4. The use of language in the system that is built is easy to understand.

3. CLOSING

This chapter will explain about the conclusions that contains the results obtained after the analysis, design, and implementation of the system design that was built and has been developed as well as suggestions that will provide important records and possible improvements that need to be done for the development of the previous system.

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 supply part in making reservations raw materials and determine the need for the production of raw materials that are used when a product order.
2. These information systems are built to help the production part in providing information production time for each order.
3. These information systems are built to facilitate the leaders in receiving notification every purchase of raw materials.
4. These information systems are built to facilitate the marketing department in determining the schedule of delivery to the customer.
5. These information systems are built eases administration and finance for controlling payment product orders from customers.

3.2 Suggestion

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

1. Development UI (user interface) and UX (user experience) so that users can more easily use the system.
2. Distribution system displays the need for development with the delivery location, taking into account the distance of deliveries and pick service delivery for any orders shipped on the same day

BIBLIOGRAPHY

[1] J. Hutahaean, *Konsep Sistem Informasi*, Yogyakarta: Deepublish, 2014.

[2] A. I. Said, *Produktivitas & Efisiensi dengan* Supply Chain Management, Jakarta: PPM, 2006.

[3] I. N. Pujawan, Supply Chain Management *Edisi Kedua*, Surabaya: Guna Widya, 2010.

[4] A. Nasution and Y. Prasetyawan, *Perencanaan dan Pengendalian Produksi*, Yogyakarta: Graha Ilmu, 2008.

[5] Z. Yamit, *Manajemen Kualitas Produk dan Jasa*, 1 ed., Yogyakarta: Ekonisia Kampus Fakultas Ekonomi UII Yogyakarta, 2005.

[6] J. Heizer and B. Render, *Manajemen Operasi* (Operations Management), Jakarta: Salemba Empat, 2006.

[7] Supriyono, *Manajemen Strategis dan Kebijakan Bisnis*, Yogyakarta: BPFE, 1999.

[8] E. Jaelani, Just In Time, 2009, Februari.

[9] Y. D. S. d. E. Agustina, "*Analisa Penerapan Sistem* Just In Time *untuk Meningkatkan Efisiensi dan Produktivitas pada Perusahaan Industri*," Jurnal Akuntansi dan Keuangan, vol. 12, pp. 135-146, 2008.

[10] B. Tjahjadi, Just- In-Time (JIT) Pusrchasing, Just-In-Time (JIT) Production System: *Pengaruhnya terhadap Kinerja Produktivitas*, 2001.

[11] R. R. Lerbin, *Peramalan Bisnis Edisi Kedua*, Jakarta: Ghalia Indonesia, 2009.

[12] B. Alma, *Manajemen Pemasaran dan Pemasaran Jasa*, Bandung: CV Alfabeta, 2005.

[13] A. Pambudi, "*Implementasi Model Perangkat Lunak Pelayanan Informasi Kegiatan Belajar Mengajar Tingkat SLTA Dengan Berbasis* Operating System *Android*," Ilmu Komputer, vol. 9, pp. 112-113, 2013.

[14] S.J., *Rekayasa Perangkat Lunak*, Yogyakarta: ANDI, 2010.

[15] I.M, *IT Audit Berbasis Resiko*, Bandung: Ikhlas Media, 2015.