DEVELOPMENT OF SUPPLY CHAIN MANAGEMENT IN CV.MARASABESSY

Sutriani Sani[1], Dian Dharmayanti[2]

[1,2]Informatic Engineering – Indonesian Computer University
Jl. Dipatiukur 112-114 Bandung
E-mail: sutrianisani28@gmail.com[1], dian.dharmayanti@email.unikom.ac.id[2]

ABSTRACT

CV. Marasabessy is one of the companies engaged in the industry to produce handmade leather shoes for men of adult size. In order to make reservations often get complaints from consumers because there is no time to finish the product in accordance with the initial agreement. Problems arising in the calculation of the purchase of raw materials for any ordering products. All issues have an impact on the delivery to determine the exact schedule and the vehicles in use for the delivery of finished products to consumers in accordance with the capacity of the vehicle.

Supply Chain strategy used in CV.Marasabessy is make to order, because the ordering of raw materials and new production is done after the market demand and really done on consumer demand. The calculation of the estimated ordering of finished product to the consumer starts from calculating the date of ordering, the date of processing up to the date of the finished order. Planning purchases of raw materials that are not in stock using the method of Economic Order Quality (EOQ) and scheduling shipments tailored to the vehicle and its capacity. Based on existing problems then it is needed a development of information systems Supply Chain Management in CV.Marasabessy.

Based on the results of blackbox testing can be concluded that this system can help manage the estimated completion of the product, helping to buy the number of ordering of raw materials to the supplier and assist in determining the delivery scheduling.

keywords : *supply chain management, make-to-order, EOQ.*

1. INTRODUCTION

CV.Marasabessy is one of the companies engaged in the industry especially producing handmade leather shoes for men of adult size. Skin used is cow leather and synthetic. The main goods produced consists of 2 types of machetes and boots. The machete type is signore and venture, while the boots are alpha boots, beta boots, signore boots, epsilon boots, and basket boots. CV.Marasabessy using make-to-order strategy that the production process is done if there is order from the consumer. Supply chain management activities contained downstream that is done with the consumer that is accepting reservations from consumers, and to distribute to consumers who have ordered the product. While the activities contained in the upstream section conducted by CV.Marasabessy with suppliers is to procure raw materials to suppliers, to accept raw materials from suppliers to manage raw materials into products.

Based on the results of interviews with Mrs. Firna As part of booking in CV.Marasabessy, stated that every order has a minimum order has been set. In the process of ordering consumers will be given information on the completion of workmanship and delivery of finished products are ordered. However, during this time Mrs. Firna often receive complaints from consumers because of not achieving the completion of the product in accordance with the initial agreement, this will affect the shipping scheduling process. Lack of management of information work in the company causes the delivery department difficulty in determining the delivery schedule of products to the consumer because the information provided by the production department for the delivery schedule of products to consumers is not appropriate from the calculation start of production until the completion of the workmanship of the product. This can affect consumer confidence in the company to be reduced and certainly can harm the company.

Based on the results of interviews that have been done in CV.Marasabessy with Mr. Taufan as part of procurement states that in the process of procurement of raw materials the amount of ordering of raw materials are usually calculated and adjusted by the number of product ordering from consumers, this makes it difficult for procurement to calculate the purchase of raw materials every Product ordering. CV.Marasabessy extends the purchase of raw materials if the company has more budget so that it has the remaining raw material production from the previous order and the remaining raw material production is stored in the warehouse, sometimes the rest of the production can be used again for the next production process. He said until now, the delivery of

ordered raw materials sometimes have to wait for 1 day or 2 days due to order queue on the supplier side. Usually in a day the ordered raw materials have arrived, but when there is a delay of raw materials up to two days. This has an impact on the delay in the production process. Late production will cause the process of delivery of products to consumers was hampered. For delivery CV.Marasabessy has two units of car box.

Based on observations that have been done according to the above problems it can be seen that CV.Marasabessy needs a Supply Chain Management development which can know the order estimation to give production completion time to the consumer, arrange the raw material procurement management using Economic Order Quality (EOQ) method of delivery scheduling and Vehicles in accordance with the capacity of vehicles to ship products to consumers.

Based on existing problems at this time, then CV.Marasabessy needed an information system development "Development of Supply Chain Management in CV.Marasabessy".

Based on the description on the background of the problem, then the problems that occur in CV.Marasabessy is how to build a Supply Chain Management System (SCM). The purpose and purpose of this study are:

1. Facilitate the ordering section to provide estimation information on finished product ordering to the consumer.
2. Facilitate the procurement department in determining the purchase needs of raw materials to be ordered to the supplier.
3. Facilitate the delivery section in scheduling delivery of products to each consumer.

2. CONTENT of the STUDY

2.1.1. The Cornerstone Of The Theory

The cornerstone of the theory on writing this thesis will explain about the theories related to information systems that will be built on the Asih Hati Furniture.

2.1.1. Information Systems

a. Job network is a system of procedures that are interconnected, gathered together to perform an activity or to solve a particular target while the Information is data that is processed into a form that is more useful and more meaningful for those who receive it. The source of information is the data. Data is the plural of the singular datum or data item. The data is the fact that depict a tapestry and a real unity. [1]

b. The system can be interpreted as the unity of the elements that have an affinity. Some elements can be merged into a unit, group, or system components with specific functions while the Information bears the meaning of benefit, if we could exploit it. The information contains the meaning of meaning, efforts to get it, understand it, use it, spread it, store it and combine that with the other information into a new information. [2]

c. According to Kusrini and Andri Koniyo "Information is data that has been processed into a meaningful form for the user, which is useful in making current decisions or supporting information sources". [3]

With reference to the meaning of the two sources above it can be concluded that the information system is the unity of interrelated elements to complete a certain goal that data are processed into a form that is more useful if we could exploit it

2.1.2. Supply Chain Management

a. Supply Chain Management is the system to apply the approach in total to manage the entire flow of information, materials, and services from raw materials through factories and warehouses to the end consumer. Supply Chain Management is the method or integrative approach to managing the flow of products, information, and integrated money involving parties ranging from upstream to downstream. Important principle in SCM is the transparency of information and collaboration among internal corporate functions as well as with the parties concerned with over the supply chain [4].

b. According to I Nyoman Pujawan and Mahendrawati "Supply Chain Management (SCM) is an integrative method or approach to managing an integrated flow of products, information and money involving parties from upstream to downstream consisting of suppliers, factories, Logistics services. "[5]

c. Based on the four opinions above can be concluded that Supply Chain Management is a network of companies that work together and mutually benefit each other in controlling, organizing and improving the flow of material and information from suppliers to users. An important principle in SCM is the transparency of information and collaboration between the internal functions of the company and with the parties in the company along the supply chain.

On the supply chain there are usually 3 kinds of flow that must be managed. Three kinds of flow that must be managed supply chain pad is as follows: [5]

1. the first is the stream that flows from the upstream barag (upstream) to downstream (downstream).
2. the second is the flow of money and the like which flows from upstream to downstream

3. Third is the flow of information that may occur from the upper to the lower or vice versa.

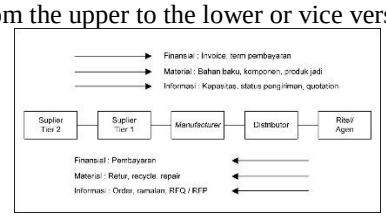


Figure 1 Simplification of Supply Chain Model and Three Types of Managed Flow

2.1.3 EOQ (Economic Order Quantity)

EOQ (Economic Order Quantity) is a simple model that can be used to determine the size of an economical order. This model considers the two shipping supplies namely incidentals expenses and save messages. The intended message is shipping fees keep coming out every time the reservation is made and does not depend on the size or the volume of the order. While the fare is fare save that results from the company store the item for a certain period.

The objective of EOQ model is to minimize the total cost of the inventory. Important cost is the cost of the reservation, the cost of placement of the order, and the cost of carrying or holding the unit inventory in stock

The EOQ formula bisaa used are:

$$EOQ = \sqrt{\frac{2SD}{H}} \quad (1)$$

$$S = H/D \quad (2)$$

Description:
D: use or demand is estimated at per time period.
S: booking fees (order preparation and preparation of the machine) per order.
H: storage costs per unit per year [6]

1.2. Model Supply Chain Management in CV.Marasabessy

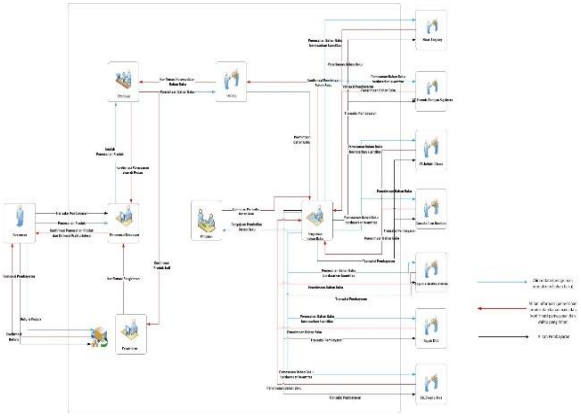


Figure 2.Model Supply Chain Management in CV.Marasabessy

1.3. Stages Supply Chain Management in CV.Marasabessy

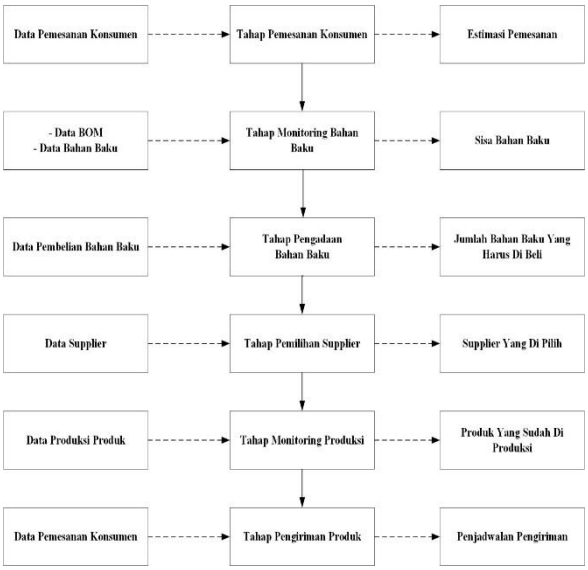


Figure 3. Stages Supply Chain Management in CV.Marasabessy

1. Stages of customer ordering

In the ordering stage is between the consumer with the reservation. Consumers will order shoe products to the ordering section, then the ordering section will calculate the estimated workmanship of the product in the consumer message to in knowing the completion time of all customer bookings. The ordering section will inform the production time to the consumer based on the calculation of the estimated workmanship of the product. Here is a picture of 4 consumer order data of June 2016.

Table 1 Customer ordering

Tgl Pemesanan	Tgl Pembayaran (Dp)	Nama Konsumen	Qty	Jenis Produk	Nama Produk	Harga Satuan	Subtotal	Alamat
7 Juni 2016	7 Juni 2016	Brodo Ganesha Indonesia	60	Parang	Signore Full Black	Rp266,350	Rp.21,308,000	Jl.Gudang Utara No.40B
			20		Ventura Full Black	Rp266,350		
7 Juni 2016	7 Juni 2016	Whole Shoes	50	Boots	Epsilon Boots Vintage Brown	Rp337,325	Rp.16,866,250	Jl.Cipaku
8 Juni 2016	8 Juni 2016	TK.Trada Solusi	55	Parang	Signore Full Black	Rp266,350	Rp.7,990,500	Jl.Gudang Selatan No.60
10 Juni 2016	10 Juni 2016	Sahara Shoes	25	Boots	Bentura Boots Choco Tan	Rp337,325	Rp.10,119,750	Cimahi
			30		Epsilon Boots Choco Tan	Rp337,325		
15 Juni 2016	15 Juni 2016	Pronesia	65	Parang	Signore Full Black	Rp266,350	Rp.10,654,000	Jl.Peta
16 Juni 2016	16 Juni 2016	Bapak Irfan	50	Boots	Signore Boots Vintage Brown	Rp320,450	Rp.16,022,500	Majalaya, Bandung
27 Juni 2016	27 Juni 2016	TK.Riman Jaya	70	Boots	Bentura Boots Choco Tan	Rp320,450	Rp.22,431,500	Bandung Timur

Based on Table 1, customer order data can be seen on the estimated result of each customer's order in table 2

Table 2 The results of the booking estimate

Tgl Pemesanan	Nama Konsumen	Qty	Jenis Produk	Nama Produk	Tgl Selesai Pemesanan	Estimasi
7 Juni 2016	Brodo Ganesha Indonesia	60 dus	Parang	Signore Full Black	8/6/2016	2 Hari
		20 dus		Ventura Full Black		
7 Juni 2016	Whole Shoes	50 dus	Boots	Epsilon Boots Vintage Brown	9/6/2016	3 Hari
8 Juni 2016	TK.Trada Solusi	55 dus	Parang	Signore Full Black	9/6/2016	2 Hari
10 Juni 2016	Sahara Shoes	25 dus	Boots	Bentura Boots Choco Tan	12/6/2016	3 Hari
		30 dus		Epsilon Boots Choco Tan		
15 Juni 2016	Pronesia	65 dus	Parang	Signore Full Black	17/6/2016	3 Hari
16 Juni 2016	Bapak Irfan	50 dus	Boots	Signore Boots Vintage Brown	17/6/2016	2 Hari
27 Juni 2016	TK.Riman Jaya	70 dus	Boots	Bentura Boots Choco Tan	29/6/2016	3 Hari

Information :

A. Estimates start from the pay date until the date of completion of the reservation.
B. To determine the start of the ordering process, in a day will be limited to 100 pcs order, if the order amount is still below the quota then the next order will start to work on the same date, but if the quota exceeds or happened min (-) as in the red column , The order quota per day then the rest of the order or the next order will be done after the previous booking is completed.
C. Starts work done a day after pay date or in accordance with the calculation of quota order per day but can not be done on the same date.

2. Stages of monitoring of raw materials

Monitoring function to avoid the occurrence of vacancies and lack of stock of raw materials in the warehouse. This inventory control monitoring requires an indicator to determine how secure the limits are for each raw material in the manufacture of shoe products that must be available in the warehouse.

Table 3 Parang Raw Material Data

Jenis Produk	Nama Bahan Baku	Pemakaian	Satuan
Parang	Insole Jamur Black	1	pasang
	Midsole Black	1	pasang
	Parang Sole	1	pasang
	Kulit Sintetis	3,3	feet
	Benang Rosel	50	cm
	Lem GR 808	40	gram
	Tekson	1	pasang
	Tali Lilin	1	pasang
	Tamsin	1	pasang
	Box	1	pcs

Table 4 Parang Raw Material Data

Jenis Produk	Nama Bahan Baku	Pemakaian	Satuan
Boots	Insole Jamur Black	1	pasang
	Midsole Black	1	pasang
	Peta Sole	1	pasang
	Kulit Sapi	3,75	feet
	Benang Nylon Hitam	60	cm
	Lem GR 808	42	gram
	Tekson	1	pasang
	Tali Lilin	1	pasang
	Tamsin	1	pasang
	Box	1	pcs

3. Stages of procurement of raw materials

Determine inventory methods by calculating the existing variables such as the ordering cost for each and the storage costs incurred to store the raw materials in the warehouse. After that, calculate the value of EOQ to know the ordering time and ordering frequency in order to be as economical as possible.

Table 5 Calculation EOQ

No.	Nama Bahan Baku	Pembelian	Jumlah	Waktu antar pemesanan	Frekuensi pemesanan
1	Insole Jamur Black	$\frac{\sqrt{2 \times 425 \times 25000}}{2100}$ = 247,61 = $\sqrt{247.61}$ = 19,73	50 pasang	= Q/D =50 /425= 0,23 Bulan =0,23x 26 hari kerja= 5,98 = 6 hari	= D/Q =425/ 50 = 3,50 = 4 kali
2	Kulit Sintetis	$\frac{\sqrt{2 \times 726 \times 25000}}{2500}$ = 290,62 = $\sqrt{290.62}$ = 17,04	17 roll	= Q/D = 17/726= 0,26 Bulan =0,26 x26 hari kerja= 6,76 = 7 hari	= D/Q =726/17= 2,56 = 3 kali
3.	Kulit Sapi	$\frac{\sqrt{2 \times 768.75 \times 25000}}{2700}$ = 260,62 = $\sqrt{260.62}$ = 15,04	15 roll	= Q/D =15 /768,75= 0,23 Bulan =0,23x 26 hari kerja= 5,98 = 6 hari	= D/Q =768,75/15= 2,56 = 3 kali
4.	Lem GR 808	$\frac{\sqrt{2 \times 2400 \times 25000}}{1200}$ = 676.62 = $\sqrt{676.62}$ = 26,01	11 kg	= Q/D = 11/2400= 0,24 Bulan =0,24 x 26 hari kerja= 0,06 = 6 hari	= D/Q =2400/ 11 = 3,50 = 3 kali

4. Stages of Supplier Selection

The next stage will be the selection of suppliers. Supplier selection will be selected based on quantity according to order requirement from consumer. Here's a table of 6 suppliers list

Table 6 Data Supplier

No.	Nama Supplier	Alamat
1.	Sinar Tanjung	Jl. Cendrawasih
2.	PT.Pemuda Tampan Sejahtera	Jl. Cikondang II
3.	Ganesha Lem Bandung	Jl. Kalibata Raya No.4A
4.	Angcona Mestika Unisole	Jl.kyai Caringin No.439
5.	Bapak Diki	Antapani
6.	PT.Intiniri Utama	Kopo
7.	Tk.Propan Jaya	Jl. Ciliwung

Here is the selection of suppliers based on quantity can be seen from Table 7

Table 7 Supplier Selection

No.	Nama Bahan Baku	Jumlah kebutuhan	Harga Satuan	Total	Pemilihan Supplier		
					Sinar Tanjung	PT.Pemuda Tampan Sejahtera	PT.Intiniri Utama
2.	Kulit Sintetis	17 roll	Rp.60.000	Rp. 1.020.000	20 roll	10 roll	0
3.	Kulit Sapi	15 Roll	Rp.80.000	Rp. 1.200.000	20 roll	10 roll	5 roll
4.	Midsole Black	20 pasang	Rp.26.000	Rp. 520.000	40 pasang	40 pasang	40 pasang

5. Stages of Production Monitoring

Production monitoring stage will be applied to the production process as production target which must be completed on a work of order product, so that the order is finished to be produced on time, according to the predicted level of difficulty of workmanship and can facilitate data collection of any finished products or semi-finished products Which is stored in the Warehouse with the name of the buyer.

Table 8 Production Monitoring

Tgl Pemesanan	Nama Konsumen	Tgl Selesai Pemesnan	Jenis Produk	Nama Produk	Jumlah yang harus di produksi (pcs)	Hasil Produksi	Selisih (pcs)	Status Produksi
7 Juni 2016	Brodo Ganesha Indonesia	8 Juni 2016	Parang	Signore Full Black	60	60	0	Selesai
				Ventura Full Black	20	20	0	
7 Juni 2016	Whole Shoes	9 Juni 2016	Boots	Epsilon Boots Vintage Brown	50	20	30	Sedang Berjalan

6. Delivery Stages

This stage is the stage in monitoring the delivery status, delivery scheduling and vehicle capacity to be used in the delivery of finished products to consumers. Distribution monitoring is done so that the product reaches the consumer at the right time and place and knows the delivery status whether received or in the process of shipping.

Table 9 Delivery Product

Tgl Kirim	Tujuan	Total Muatan	Pengemudi	Jenis Kendaraan	No Polisi	Status	Tgl Terima
10 Juni 2016	Jl.Cipaku	105 dus	Ahmad	Box Granmax	D 94xx AL	Proses	
10 Juni 2016	Jl.Gudang Selatan No.60						
13 Juni 2016	Cimahi	55 dus	Tomi	Box Granmax	D 94xx AL	Diterima	13 Juni 2016

2.4 Database analysis

Database analysis on the information system to be built using ERD. ERD is a data model that uses several notations to describe data in the entity context and the relationships described in the data. The diagram is illustrated in Figure 4

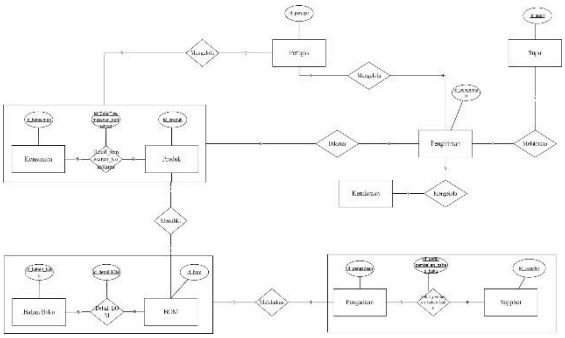


Figure 4 Diagram ERD

2.5 Context Diagram

Context diagram is a model to explain globally how data is used and transformed to process or describe the flow of data into and out of the system. Context diagram on this system can be seen in Figure 5

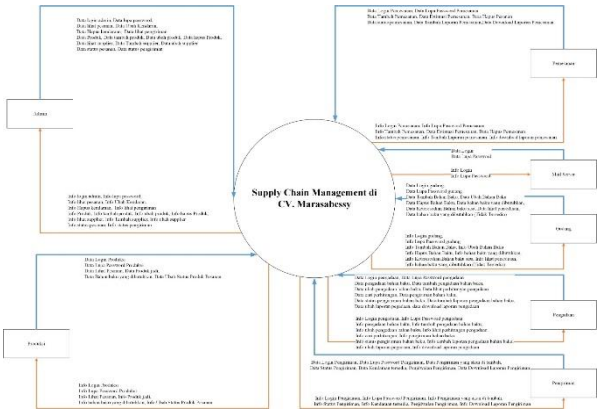


Figure 5 Context Diagram

2.6 Table Relationships

Table relation describes the relationship between data, meaning data and limitations. The process of relation between attributes is a combination of attributes that have the same primary key, so that these attributes into a unity that is connected by the key field. Table relation is described in Table 10

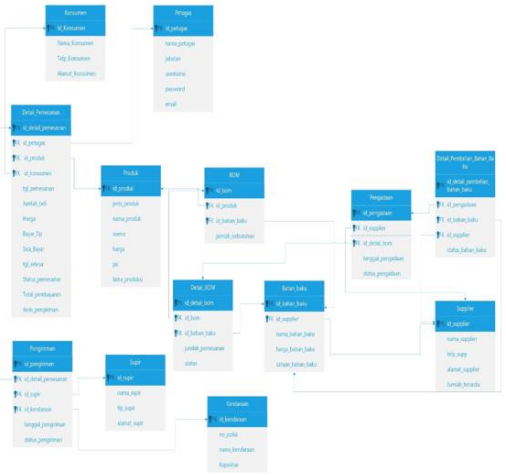


Figure 10 Table Relationship

2.7 Interface design

Interface design is made to describe the appearance of the program that will be used by the user to interact with the system to be created. Interface design in information systems with supply chain management approach Here is the ordering interface in Figure 7



Figure 7 Interface design ordering

The following is the procurement part interface in the process of calculating raw material procurement using EOQ method in figure 8

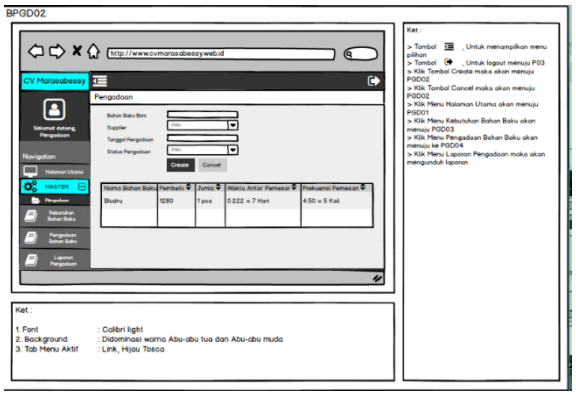


Figure 8 Interface design Procurement

Here is the delivery section interface on the shipping schedule process in figure 9

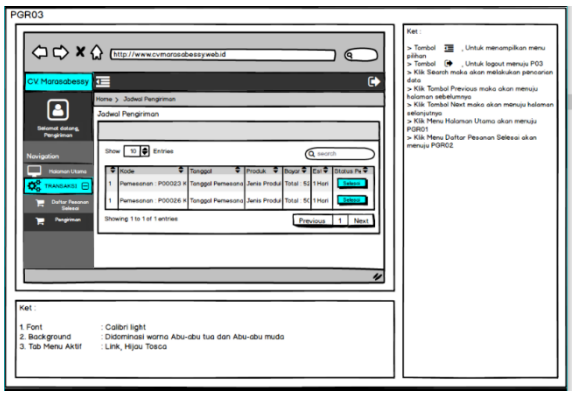


Figure 9 Interface Delivery

2.8 Procedural Design

Procedural design transforms the structural elements of the program architecture into a procedural description of the software components. The procedural design for the application to be built is as follows

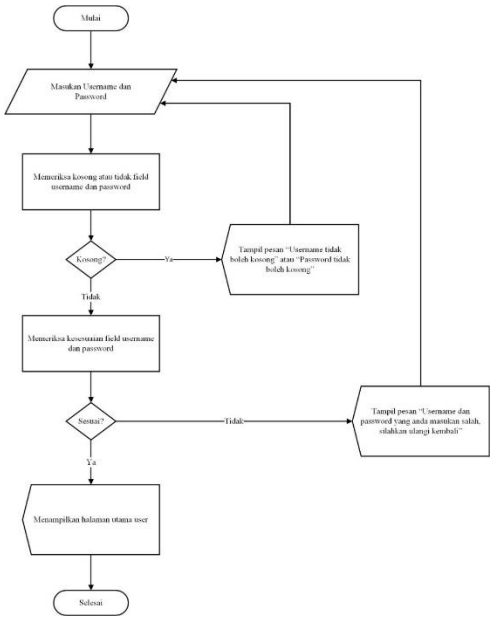


Figure 10 Procedural Design

2.9 Conclusion testing blackbox

Based on the results of testing systems that have been done as a whole can be concluded that the application process Information System Supply Chain Management is quite maximal and system functionality has been able to produce the expected output.

2.10 Conclusion testing blackbox

Based on the results of system testing that has been done as a whole can be concluded that the application process information system Supply Chain

Management is enough m2.10 Conclusion beta testing

1. This built information system can facilitate the administrative part of ordering in processing the process of ordering products from consumers.
2. The information system built can facilitate the warehouse in monitoring raw material inventory in the warehouse.
3. Information system built this can facilitate the procurement in determining the amount of procurement of raw materials as needed.
4. This built information system allows bagina delivery in determining which order products should be sent first.

3 CLOSING

3.1. Conclusion

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

1. Supply chain management system can help the booking department to know the exact schedule of completion of each order to inform the customer, no longer rely on intuition in calculating the completion of the order, so no complaints from consumers because the information submitted will be sure and timely.
2. Supply chain management system can help the procurement department to determine the procurement of raw materials that must be purchased in accordance with the necessary needs, so that production activities run smoothly no longer the problem of shortage of raw materials in production, thus the production stage and delivery stage Running well and on time in delivery of products according to a predetermined length of production.
3. Supply chain management system can assist delivery department in determining the delivery schedule of products that must be sent by looking at the production status, delivery is done when the product has been completed produced by the duration of a product ordered by the consumer, and facilitate the choice of vehicles according to the capacity to be used There in the company.

3.2 SUGGESTION

Suggestions for the development of this information system there are several suggestions that can be done, among others:

1. Make it look more interesting because the display is still used now simple, And need the development and better maintenance of the system that has been built, so the system can be used in accordance with the needs in the future.
2. Further research is expected that the built system can manage the display ganchart monitoring employees, raw material data can be recorded in a period of 1 day, displaying the vehicle recommendation data in accordance with the capacity in the determination of delivery and display product returns and raw materials in the program.

BIBLIOGRAPHY

[1] Kadir Abdul. (2014). *Pengenalan Sistem Informasi*. Yogyakarta: Andi Offset.

[2] Ladjamudin, Al-Bahra, (2005). *Analisis dan Sistem Informasi.* Yogyakarta: Graha Ilmu.

[3] Kusrini dan Andri Koniyo, (2003). *Sistem Informasi* . Bandung : Wijaya.

[4] Siahaya, Willem. 2013. *Sukses Supply Chain Management Akses Demand Chain Management*. Jakarta: In Media.

[5] I. N. Pujawan dan M. ER. (2010) . *Supply Chain Management Edisi Kedua*. Surabaya : Guna Widya.

[6]Mahardika,dkk. (2012) . *Analisis Pengendalian Persediaan Bahan Baku dengan Pendekatan Metode Economic Order Quantity (EOQ) dan Metode Kanban*.Jurusan Teknik Industri , Universitas Brawijaya ,Malang.