DEVELOPMENT SUPPLY CHAIN MANAGEMENT (SCM) IN CV.RISMAN WIJAYA KERAMIK

Fauzi Sandy Peraja[1], Gentisya Tri Mardiani[2]

[1,2]Informatics Engineer – Universitas Komputer Indonesia
Jl. Dipatiukur 112-114 Bandung
E-mail: fauzisandyperaja@gmail.com[1], gentisya.tri.mardiani@email.unikom.ac.id[2]

ABSTRACT

CV. Risman Wijaya Keramik is one of the companies engaged in the industry for producing a variety of decorative ceramic vase for home decor. CV. Risman Wijaya Keramik in the booking often get complaints from consumers since it is not the time to achieve the completion of the products according to the initial agreement, the difficulty in determining a plan of purchasing raw materials and primary supporter, the difficulty in determining the schedule of delivery and packaging of each product as a result of consumer demand is not met.

Based on the existing problems of current required a construction of information system in Supply Chain Management CV Risman Wijaya Keramik. Purpose facilitate reservations in determining estimated completion products, simplify procurement head count the number of raw materials are ordered to the supplier first monitor stocking of raw materials in the warehouse with the method of Safety Stock calculation then planning the purchase of major raw material ingredients using Reorder Point (ROP) and supporting raw materials by the method of Economic Order Quantity (EOQ) and makes it easy to schedule the delivery of the product to the consumer with customize business rules that exist in the company.

Based on the test results it can be concluded that the system is already helping to manage the estimated completion of the product, helps determine the amount of raw materials to the supplier and helps in determining the schedule of delivery.

Keywords: supply chain management, safety stock, Reorder Point, Economic Order Quantity.

1. PRELIMINARY

CV. Risman Wijaya Keramik is one of the companies that engaged in the industry for producing a variety of decorative ceramic vase for home decor. Product merchandise consists mainly of the vase A/smalles consists of ceramics (sun flowers, toraja and roppers's), B/Wood (AL, DB, and RWK), C/Rusty (Pin, Agape Greek and Bellaza), D/Antique (Bella, Glacier and Pumpkin), E/Modern (Two Rings, the Bird Cage and the Silver Prada). locate in Purwakarta Regency Plered, CV. Risman Wijaya Keramik tile distributors has been serving several to the outside and within the country. The strategy used is make to order i.e. the production process and purchase some raw materials (raw material of supporters) will do if there are orders from consumers. SCM activities contained in the downstream, namely taking orders and shipping confirmation from consumers, while activities in the upstream, namely procurement of raw materials to the supplier, the reception of raw materials from suppliers, management of raw materials into products. For delivery finished products to consumers there are two ways i.e. consumers take it directly to the company or the company doing the shipping to consumers. for the delivery of finished products to consumers using shipping services party PT. Indah Cargo Logistic for the local distributor, PT Ritra Cargo Indonesia for distributors abroad.

Based on interviews conducted with the mother Hj. Risna as part of booking, Supply chain management Activities that are part of the problem was found on the lower reservations often receive complaints from consumers since it is not the time to achieve the completion of the products according to the initial agreement, this led the sending part of the difficulty in determining the schedule of product delivery to consumers because the information is given for the schedule of delivery of the product to the consumer is not appropriate from the start of production until the completion of the work product.

Based on interviews conducted by Mr. Asep as the head of procurement stated that the main raw material for, if product demand from consumers rises would be done re provision of raw materials to the time of booking for 7 days, if the stock of raw materials in warehouses depleted production process will stop because of the time of booking which is long enough. This be to delay the production process that will result in losses a waste of time, manpower and semi-finished product buildup in the warehouse. While proponents of raw material procurement is done after knowing the amount of consumer products, but the process of procurement often have excess or shortage of raw materials as a result if the excess, raw materials piled up in storage this can have an impact to the risk of damage to raw materials and a decrease in the quality of the ingredients, if the procurement is experiencing a shortage of the raw material must be

booked then reset to supplier this may losses this incurred any costs will be higher.

Based on interviews conducted with Mr. Saepulloh as the head of shipping, stating that in shipping to the distributor of the product must be in the down first and the packaging will be adjusted to the size of the product to the next in the specify capacity down in vehicles in service delivery and schedule booking vehicles in service delivery, the problem found the head of shipping have difficulty in determining when a product should be sent and specify the packaging of each product to fit the capacity of trucks in service delivery as a result of product distribution are blocked and needs consumer products ordered can not be fulfilled.

Based on problems that have already existed at the time, then on the CV. Risman Wijaya Keramik required a construction of information systems that can manage the procurement of raw materials management monitoring inventories of raw materials and consumers booking management then needed an information system construction of information system in Supply Chain Management (SCM) in CV Risman Wijaya Keramik.

The purpose of the aka is the research is:

1. Facilitate the ordering section to provide information estimation of long time completed bookings to consumers.
2. Facilitate the procurement section in calculating the amount of raw materials (main and supporters) that must be reserved to the supplier.
3. Facilitate the delivery part in arranging the booking schedule vehicles in service delivery and specify packaging and packaging in accordance with vehicle capacities in service delivery.

2. RESEARCH METHOD

2.1. The Cornerstone Of The Theory

The cornerstone of the theory on writing this thesis will explain about the related theories the information system will be built at CV Risman Wijaya Keramik.

2.2. System Information

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]

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. Information meaning the meaning of business, to get it, understand it, use it, for save it and combine that with the other information into a new information. [2]

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

2.3. Supply Chain Management

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 between internal functions the company as well as with the parties concerned with throughout the supply chain. Supply chain is a physical networks, i.e. the companies involved in the supply of raw materials, manufacture products, and send it to the end user. These companies usually include suppliers, manufacturers, distributors, retail as well as supporting companies such as logistics service companies. [4]

2.4. Safety Stock

Order an item until the item it comes necessary period of time varies from a few hours to months. The time difference between the time of order until the items come known as the grace time (Lead Time). Grace time is influenced by the availability of ordered goods and the distance between the location of the consumer and suppliers. The uncertain lag time resulted in a shortage of goods for example due to the use of goods that are greater than previously expected, thus it takes a inventory safety (safety stock). [3]

Formula safety inventory (safety stock) can be calculated with the formula:

Safety Stock = average Usage Period
Previous x Lead Time

Where:

Lead Time = waiting time
L = Grace time Safety Stock

2.5. Reorder Point

Reorder Point (ROP) or rebooking point was when the mains reaches the point where it needs to be done reordering stated. ROP model occurs when the amount of inventory in stock reduced steadily so we should determine how much minimum inventory level to consider so there is no shortage of supplies. The amount of the expected count during the grace period, probably can also be added with the Safety Stock which usually refers to the probability or possibility of shortage of stock during the grace period.

In order to purchase the ingredients that are already defined in the EOQ do not interfere with the smooth running of production activities, then takes a

reordering of the raw materials. Factors affecting the reordering points is [5]:
Reorder Point can be searched by the following equation:
ROP = (d x L + SS)
Where:
ROP = point of booking (Reorder Point)
d = total expenditures
L = waiting time
SS = Safety Stock

2.6. 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 not Depending 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. [6]

The EOQ formula can used are:

$$EOQ = \sqrt{\frac{2SD}{H}}$$

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]

2.7. Model Supply Chain Management in CV. Risman Wijaya Keramik

Here is a model of supply chain management that is in CV Risman Wijaya Keramik in Figure 2.7

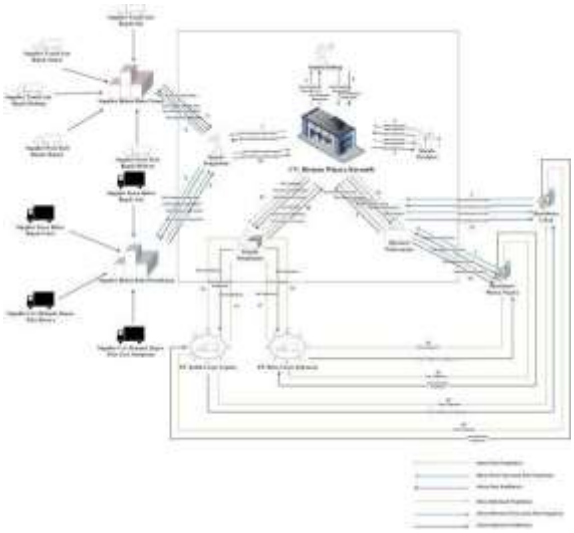


Figure 2.7 Model Supply Chain Management di CV. Risman Wijaya Keramik

2.8. Stages of Supply Chain Management in CV. Risman Wijaya Keramik

Here are the stages of supply chain management that is in CV Risman Wijaya Keramik in Figure 2.8



Figure 2.8 Stages Supply Chain Management in CV. Risman Wijaya Keramik

2.9. Consumer booking analysis

Analysis of consumer, namely booking transaction consumer orders in certain periods to be sampled in the analysis of Supply Chain Management, consumer reservations contained in the estimation of the booking to find out when the estimated completion of the booking product consumers.

2.10 Transaction Ordering

Booking transaction data from the consumer transaction data used are periods of February can be seen in table 2.9

Table 2.9 transaction ordering consumer

2.10 Estimate Transaction

The data consumer of booking estimation is estimation of the completion of the data products from consumer bookings in the period February 2016

Data estimated completion of the booking costumer products can be seen in table 2.10

Table 1.10 estimated transaction consumer

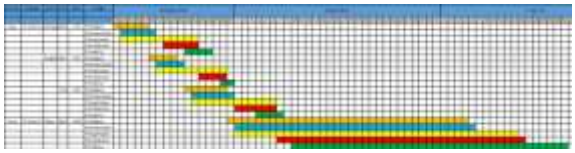


2.11 Gantchart Estimated transaction

Gantchart estimation of reservations from c is that process in detail from the production of ordering consumer.

Ganchart of estimation of booking consumer products can be seen in table 3

Table 2.11 Gantchart estimated Transaction consumer



2.12 Analysis of the monitoring function of monitoring suppliers raw materials to avoid

The occurrence of the vacancy and the shortage of raw material stock in the warehouse. Monitoring inventory control requires an indicator to determine how safe limits for each raw material in the manufacture of products that should be standard door leaves are available at the warehouse by using the method of safety stock. Application of the method of safety stock calculation process, namely the preparation of safe limits that must be available in the warehouse for the next period and point of booking again.

The process of monitoring the supplies of raw materials by using the method of safety stock can be seen in table 2.12

Table 2.12 Monitoring Inventories of raw materials and the Safety Stock

No.	Nama Bahan Baku	Rencana Kebutuhan	Persediaan Gudang	Safety Stock	Rencana Pembelian
1.	Tanah Liat	20,625 ton	6 ton	5 ton	20,625 + 5 − 6 = 19,625 ton
2.	Pasir kali	1,031 ton	3 kuintal	0,232 ton	1,031 + 0,232 − 0,3 = 0,963 ton

2.13 the analysis of procurement of raw materials

Determining method of preparation by calculating variables such as booking fees for any storage costs incurred and to store raw materials in warehouses. After that, counting the raw material that has a stock by using the Reorder Point and method of calculating the EOQ for raw materials that do not have stock in order to know the time of booking and reserving frequencies for economic possible.

2.14 Data Calculation ROP

Data calculation of ROP used to calculate the main raw materials purchases that has a stock of warehouse in order to purchase raw materials in accordance with the stock of raw material warehouse

The process of procurement of raw materials with the calculation methods of the ROP can be seen in table 2.14

Table 2.14 ROP Procurement Calculation

Pembelian	Perhitungan	ROP	Pembagian Supplier Tanah Liat Bapak Oni	Pembagian Supplier Tanah Liat Bapak Samsu	Pembagian Supplier Tanah Liat Bapak Endang
Tanah Liat	$5 + (7 \times (\frac{20,625}{27}))$ $= 5 + (7 \times 0,763)$ $= 10,341$	10 ton	$10 \times (\frac{50}{100}))$ = 5 Ton	$10 \times (\frac{25}{100}))$ = 2,5 Ton	$10 \times (\frac{25}{100}))$ = 2,5 Ton
Pasir Kali	$0,232 + (7 \times (\frac{1,031}{27}))$ $= 0,232 + (7 \times 0,038)$ $= 0,498$	0,498 Ton = 5 Kwintal	-	-	-

2.15 Cost calculation of the Data Message

Cost calculation of the data messages are used to calculate the cost of the message before the raw material is calculated using the EOQ method

Raw material procurement process with calculation of EOQ method by first calculating the cost of booking can be seen in table 2.15

No	Jenis Biaya	Jumlah
1	Biaya Telepon	Rp. 100.000
2	Biaya Pengiriman	Rp. 1.400.000
Total biaya pemesanan		1.400.000 + 100.000 = Rp. 1.500.000

Table 2.15 Message Cost EOQ

2.16 Data Calculation Cost Save

Cost calculation of the data store is used to calculate the cost of the message before the raw material is calculated using the EOQ method

Raw material procurement process with calculation of EOQ method by first calculating the cost of the store can be seen in table 2.16

Table 2.16 Costs Save EOQ

No	Nama bahan baku	Kebutuhan	Biaya simpan (H) (RP)
3.	Cat	3,3 kw	H = 600.000 : 3,3 = 181818,182 = 182.000
4.	Dempul	1,65 kw	H = 600.000 : 1,65 = 363636,364 = 364.000
5.	Impra	0,82 kw = 82 kg	H = 600.000 : 82 = 7317,073 = 7.400
6.	Kayu Bakar	24,75 ton	H = 600.000 : 24,75 = 24242,424 = 25.000

2.17 the Data calculation of EOQ

Data calculation of EOQ costs used to calculate the purchase of raw materials or supporting materials you do not have sufficient stock in order to purchase raw materials could be minimal as possible. Raw material procurement process with calculation of EOQ method can be seen in table 2.17

Table 2.17 Procurement calculation of EOQ

No	Nama Bahan	Perhitungan	Jumlah	Waktu untuk pemesanan	Frekuensi pemesanan	Supplier
1.	Cat	$\frac{\sqrt{2 \times 3,3 \times 12000}}{18,2000}$ = 1,888 $=\sqrt{1,888}$ = 1,375	1 Kwintal	= Q/D = 1,3 : = 0,101 Bulan =0,101 x 29 hari kerja = 2,737 = 9 hari	= D/Q = 3,91 = 3,3 = 3 kali	Toko Bintang
2.	Dempul	$\frac{\sqrt{2 \times 1,65 \times 12000}}{364000}$ = 0,471 $=\sqrt{0,471}$ = 0,686	1 Kwintal	= Q/D = 1,5:365= 0,606 Bulan = 0,606 x 29 hari kerja= 17,574 = 17 hari	= D/Q =1,65:1= 1,65 = 2 kali	Toko Bintang
3.	Impra	$\frac{\sqrt{2 \times 82 \times 12000}}{7400}$ = 1132,432 $=\sqrt{1132,432}$ = 33,647	34 kg	= Q/D = 34/82= 0,415 Bulan = 0,415 x 29 hari kerja= 12,035 = 12 hari	= D/Q = 82/34 = 2,412 = 2 kali	Toko Bintang
4.	Kayu Bakar	$\frac{\sqrt{2 \times 24,75 \times 52000}}{15600}$ = 202,90 $=\sqrt{202,90}$ = 10,147	10 ton	= Q/D = 10/24,75= 0,404 Bulan =0,37 x 29 hari kerja= 11,716 = 11 hari	= D/Q =24,75/10=2,475 = 2 kali	Bapak Ade

2.18 Analysis payment of raw materials

Analysis of the payment is applied to raw materials namely comparing raw material procurement Chief of payments to suppliers and before calculated use of methods and after using the method.

The payment process of raw materials after the calculation by using the method of ROP and EOQ can be seen in table 2.19

Table 2.18 Payment of raw materials

Tanggal Pesan	Nama Supplier	Alamat	Bahan Baku Yang Dipesan	Jumlah	Total Harga
1-Feb-16	Bapak sin	Anjun	Kayu Bakar	5 pick up	Rp2,500,000
2-Feb-16	Bapak mamun	Cikao Bandung	Pasir Kali	600 kg	Rp360,000
4-Feb-16	Bapak jenny	Anjun	Tanah Liat	3 ton	Rp600,000
4-Feb-16	Bapak dodoy	Anjun	Tanah Liat	3 ton	Rp600,000
5-Feb-16	Bapak onna	Tegal Waru	Tanah Liat	6 ton	Rp2,350,000
15-Feb-16	Toko jeans	Plered	Cat	1 lew	Rp1,500,000
			Dempul	50 kg	Rp175,000
			Impra	50 kg	Rp1,000,000

2.19 Analysis Monitoring of production

Analysis of monitoring of production will be applied to the production process as a production target to be completed at a work product orders, so that the finished order produced on time, according to the difficulty level of workmanship that was already previously thought and can facilitate logging anywhere product so the products or semi-finished stored in the warehouse with the name transaction.

Thus can ease the head of production to determine the products that are ready to be sent to consumers appropriate levels long production and level of difficulty products in the message by the consumer.

Monitoring of production processes can be seen in table 2.19

Table of 2,192 Production Monitoring

Jenis Produk	Qty	Jumlah Maksimal Satu Kali Produksi (vase)	Lama Produksi satu kali produksi Hari	Perhitungan Waktu Produksi	Total Waktu Yang Dibutuhkan (Hari)
Modern	430	300	10	430 x 10/300 = 4300 / 300 = 14,3 Dibulatkan = 20	20
Antique	370	300	10	370 x 10/300 = 3700 / 300 = 12,3 Dibulatkan = 20	20
Rusty	1700	400	10	1700 x 10/300 = 17000 / 400 = 42,5 Dibulatkan = 50	50
Smalles	150	350	10	150 x 10/300 = 1500 / 350 = 4,3 Dibulatkan = 10	10

2.20 Delivery Analysis

These stages are stages in monitor delivery status, delivery scheduling and capacity of the vehicles that will be used in the delivery of finished products to consumers. Monitoring the distribution was done so that the product is up to the consumer at the right time and place and know the shipping status whether received or are in the process of delivery.

The delivery process can be seen in table 2.20

Table 2.0 product delivery to consumers

Nama Distributor	Tanggal Pengiriman	Qty	Kendaraan yang dipesan	Jumlah kendaraan yang dipesan	Tujuan	Jasa Pengiriman yang dipesankan	Status pengiriman	Tanggal Diterima
Yayasa Art	26-Feb-16	1600	Container 40 feet	1	Jl. Kerung, Jakarta	Indah Cargo Logis	Diterima	27-Feb-16
Style Craft	10-Apr-16	370	truck colt diesel	4	Ekspor Taiwan	PT Rera Cargo Indonesia	Retur	-

2.21 The analysis database

Data base analysis on the information system will be built using the ERD. ERD is a data model that uses some notation to describe the data in the context of the entities and relationships in the data described by the. As for the chart depicted in Figure 2.21

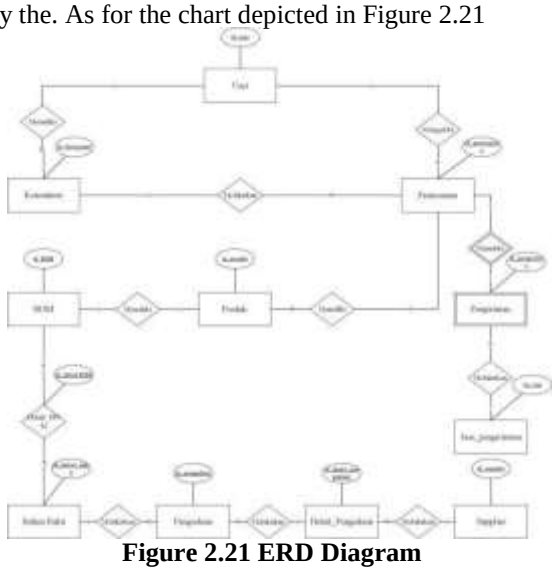


Figure 2.21 ERD Diagram

2.22 The Diagram Context

Context diagram is a model to explain how data is used globally and is transformed to the process or describe the flow of data into and out of the system. This system context diagrams can be seen in Figure 2.23



Figure 2.22 Context Diagram

2.23 Table Relation

Table relation describing relationships between data, meaning data and their boundaries. The process of relationship between attributes is a combination between an attribute that has the same primary key, so that these attributes into a single entity linked by the key field. Table relationships are described in Figure 2.24



Figure 2.23 Table Relation

2.24 The design interface

The design of the interface was created to illustrate the appearance of the program that will be used by the user to interact with the system to be created. The design of the interface in information systems with supply chain management approach

Here is the operator interface of the reservation booking process in Figure 2.24

2.24 Operator interface Design image transaction order process

Here is the interface of the head of the procurement process in the procurement of raw materials calculation method using EOQ in Figure 2.24

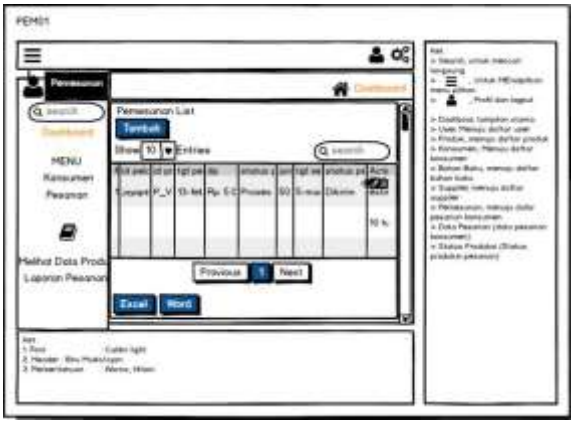


Figure 2.24. The design of the interface is the head of procurement calculation of EOQ

Here is the interface of the head of the procurement process in the procurement of raw materials using the calculation method of ROP in Figure 2.24



Figure 2.24. The design of the interface is the head of procurement calculation ROP

Here is the interface the shipping delivery schedule process head on picture 2.25

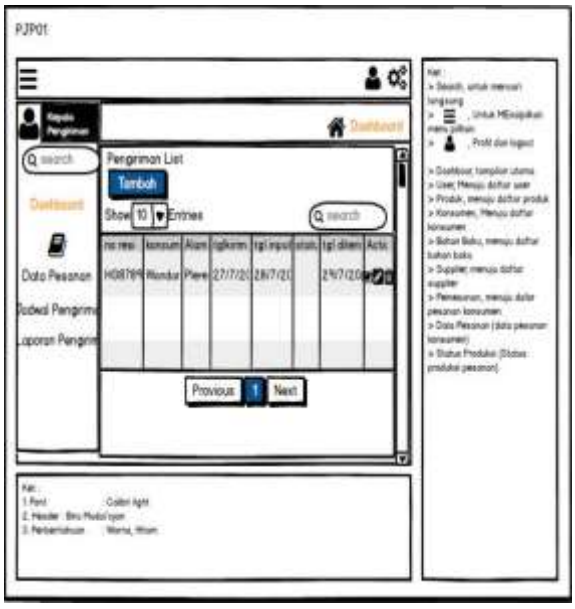


Figure 2.25. The design of the interface is the head of the delivery process delivery schedule

3.12 Conclusion the blackbox testing

Based on the results of the testing of the system has done to the overall conclusion that can be drawn on the application process information systems Supply Chain Management system functionality and yet haven't been able to produce the expected output as the look of DP on consumer booking yet appropriate placement and input DP can not enter if DP is already 50%, yet the presence of gantchart in the estimation of the booking, the procurement of raw materials data has yet to be recap in the period of 1 day display data, not to the vehicle in accordance with the recommendations of the capacity in the determination delivery, yet the presence of returns of products and raw materials.

2.25 Conclusion beta testing

1. Information systems are built it can simplify the operator's booking in processing the booking process the product from consumers
2. Information system that can facilitate head of warehouse built in monitor supplies of raw materials in the warehouse
3. Information systems are built it can ease the head of procurement in determining the amount of the procurement of raw materials as needed.
4. Information systems built this eases the delivery head in determining which order products should be sent first.

3. COVER

3.1. Conclusions

Based on the results obtained in the writing of this final task, then a conclusion can be drawn as follows:

1. the information system can be built help in booking operators perform calculations estimated completion products for consumers but have not been able to facilitate the overall process as most still do not fit within the ordering processing products from consumers because the look of DP on consumer booking yet appropriate placement and input the DP has not been able to enter if DP is already 50%, yet the presence of gantchart in the estimation.
2. Information systems that are built can help determine the amount of the procurement section in procurement of raw materials to the supplier ordered but not yet simplify the overall process because some still unresolved because the existence of a recap of procurement in 1 day.
3. Information systems can be built assist the head of shipping in determining the schedule of delivery of the finished product but have yet to ease overall because most processes are still not appropriate because not showing data on the vehicle in accordance with the recommendations of the capacity in determination delivery.

3.2. Any suggestions

Suggestions for the development of information systems there are a few suggestions that may be made, inter alia:

1. make it looks more interesting again because the display being used now still modest, as well as the need for development and better maintenance of the system that has been built, so that the system can be used in accordance with needs in the future.
2. further Research expected the system to be built can do maintenance display DP on booking consumers who have yet to match its placement and input of entrance if DP already 50%, yet there are display gantchart on estimation of booking data procurement of raw materials can be recap in a period of 4 days, showing the data capacity of a vehicle in accordance with the recommendations in the determination delivery, showing returns of products and raw materials in the program.

BIBLIOGRAPHY

[1] Jogiyanto. (2005). *Analisis dan Desain Sistem Informasi*. Yogyakarta: Andi.

[2] Sugiyono, (2013). *Metode Penelitian Kuantitatif, Kualitatif, dan Kombinasi (Mixed.Methods)*. Bandung: Alfabeta

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

[4] Jacobs, F. R., & Chase, R. B. (2008). Dalam O. a. Core. Boston: McGraw-Hill.

[5] Yamit dan Julian. (2008). Manajemen Persediaan. Yogyakarta : Ekonisia.

[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.