DEVELOPMENT OF INFORMATION SUPPLY CHAIN MANAGEMENT SYSTEM (SCM) IN CV. NICKY COLLECTION

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ABSTRACT

CV. Nicky Collection is one of the companies engaged in convection services. CV. Nicky Collection produces various types of clothing such as shirts, pants, skirts, almamater suits and jackets. CV. Nicky Collection often receives complaints from customers, due to the process of consideration is completed booking does not comply with the initial decision. Further problems arise that make it difficult when calculating raw material purchases and things that often occur in determining the delivery schedule.

Supply Chain strategy used in CV. Nicky Collection is using Make to Order strategy, because the ordering of raw materials and new production is done after the ordering from the customer. Calculation of estimated completion of product order starting from date of payment to date of completion of ordering. Monitoring the stock of the main raw materials in-stock using the method of Safety Stock. Planning purchases of raw materials that are not in-stock using Economic Order Quantity (EOQ) method. Shipment scheduling is performed if the customer ordered product has been completed and payment has been paid. Based on current problems, it needs a development of Supply Chain Management information system in CV. Nicky Collection.

Based on the test results that the Supply Chain Management information system can facilitate the Section of the Booking Operator in processing the order process, facilitate the Head of Procurement Division in determining the amount of raw material procurement to the supplier, facilitate the Head of Shipping in determining the delivery schedule.

Keywords : *Supply Chain Management, Make to Order, Safety Stock, Economic Order Quantity.*

1. INTRODUCTION

CV. Nicky Collection is one of the companies engaged in convection services. CV. Nicky Collection Convection produces various types of clothing such as shirts, pants, skirts, alma mater suits, and jackets. In the business process CV. Nicky Collection uses the Make to Order strategy of purchasing raw materials from suppliers first, then the new production process is done after the ordering of products from customers. The downstream Supply Chain Management activities applied by CV. Nicky Collection to the customer that is to accept orders directly from customers and delivering products to customers. While, the activities applied in the upstream is between CV. Nicky Collection and suppliers that is by procuring raw materials from suppliers, receiving raw materials from suppliers, and managing raw materials into products.

Based on data obtained from interview with Ibu Hj. Anggriani as the Booking Operator Section, she often receive complaints from customers. The process of estimating the completion of an order that is inconsistent with the initial agreement becomes one of the reasons causing the complaint to occur. This causes difficulties in the Section Head of Delivery in determining the delivery schedule of the product to the customer, the cause is none other because the information given on the delivery schedule of the product does not match from the calculation of production until the completion of the product.

Based on an interview with Mr. Harry as Head of Procurement Division, explained that in the process of procurement of raw materials from suppliers, raw materials are divided into two parts, there are the main raw materials and supporting materials. The main raw material is raw material in-stock, for example jeans naomi cloth. While the supporting materials is raw materials that is not in-stock, such as sewing thread 40/2, obras yarn, metal zipper, metal buttons, and plastic opp. In the process of ordering raw materials that are not in-stock support spare time that must wait 1 to 2 days, caused by the queue of reservations to the supplier. It also has an impact on production

delays. Then, the blocked production will make the product to be semi-finished and the process of delivering to the product to the customer will automatically be hampered. Then the problem will arise on the main raw material in-stock, the ordering process is adjusted by the number of products ordered. This makes it difficult for the Section Head of Procurement to calculate the purchase of raw materials on each product order. To overcome that problem, the Head of Procurement Division always provides more stock for main raw materials. But, evidently the policy also appear the problems, because the excess of raw materials will make a large inventory costs, then the quality of raw materials will also decline if stored in a long time and if there is a shortage of raw materials the company difficulty replacing it, especially when there is a failure of production making loss for the company.

From the other side, based on an interview with Mr. Indra as Head of Shipping Section, explained that the company sent the product through the delivery service. This is will arise the problem of the Head of Shipping Section admitted often difficulty in determining the delivery schedule because there is no delivery schedule in the company, this problem also resulted in the delivery of the product is inhibited.

Based on the problems of CV. Nicky Collection that described above, it appears that the company needs a development of information systems related to customer order management, raw material procurement management, monitoring raw material procurement and product delivery management to customers. Therefore in other words to handle the problems that occur in the CV. Nicky Collection required a Development of Supply Chain Management Information System (SCM) in CV. Nicky Collection.

2. RESEARCH CONTENT

2.1 Theoretical Basis

Theoretical basis aims is to provide an overview of the sources and studies of theories related to development. The theoretical basis that will be discussed is the theory of information systems Supply Chain Management, recognition (monitoring), inventory (inventory), security stock (safety stock) and distribution.

2.2 Supply Chan Management

The definition about Supply Chain Management according to several sources are as follows:

1. Supply Chain Management is a total approach system to deliver products to the last customers using information technology to coordinate all suppy chain elements start from supplier to retailer, then to reach the next level which is a competitive advantage not available in traditional logistics systems. [1]
2. Supply Chain Management is managing and aligning entities, processes and activities to produce the products and services for customers. [2]

2.3 Safety Stock

To order an item until the item comes, it takes a varies period of time from several hours to months. [3]

Safety stock can be calculated by the following formula:

Safety Stock = Average use of previous period x Lead Time

Where :

Lead Time = Wait Time

L = Grace Time (Safety Stock)

2.4 Economic Order Quantity (EOQ)

Economic Order Quantity (EOQ) is the most economical purchase amount by purchasing EOQ regularly, then the company will bear the minimal cost of material procurement. [4]

EOQ formula commonly used is:

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

Information:

D: The expected use or demand per time period.

S: Booking fee (order preparation and machine setup) per order.

H: Storage cost per unit per year

2.5 Problem Analysis

The problem analysis of the current system is as follows:

1. Operator Booking Section difficulties in determining the estimated completion of the order to be informed to the customer so that the calculation of the estimated completion of the reservation is not in accordance with the initial agreement that has been promised.
2. Head of Procurement has difficulties in determining the purchase needs of raw materials to be ordered to suppliers so that the production process and delivery schedule will be inhibited.
3. The Section Chief of Shipping has difficulties in determining the scheduling

of delivery of the product to every customer who has made the order because it is not timely and not in accordance with the ordering agreement so that the Section Head Delivery experience difficulty in determining when the product should be sent.

2.6 Analysis of Supply Chain Management Methods

Supply Chain Management Analysis is used to apply Supply Chain Management approach to the system to be built. Framework of SCM work in CV. Nicky Collection can be seen in table 1.

Table 1 Supply Chain Management Framework (SCM) in CV. Nicky Collection

No	Framework Elements	Sub Framework Elements	Implementation In Research
1.	Supply chain network structure	Vertical Structure	Internal relationships between: 1. Booking Operator Section 2. Head of Warehouse 3. Head of Procurement Section 4. Head of Production 5. Head of Shipping Section External Relationships between: 1. Supplier 2. Customers 3. Shipping Services
		Horizontal Position	CV. Nicky Collection is in a position as a source to produce and deliver products to customers.
2.	Supply chain business process	Booking	The Booking Operator Section records the incoming product order data from the customer along with the details, records the customer's data, and records the total payment which can be settled or paid advance payment of 50% as a sign of booking.
		Warehouse	Head of Warehouse to monitor available raw material inventory in warehouse, list of requirement of raw materials needed.
		Procurement	Procurement of raw materials is made if there is an order from the customer and if the minimum stock of raw materials in the warehouse is not available.
		Production	Head of Production Department checks the products being produced with the status of finished products and semi-finished products.
		Delivery	The Section Chief sends the finished product to the customer.
		Return	Process of product return from customer if there is damage, incompatibility caused by negligence of company, process of return done 1 week from date of received product.
3.	Supply chain management component	Workflow structure / work activities	1. Cooperation between CV. Nicky Collection with suppliers for raw material procurement, suppliers involved more than 1 supplier for each raw material. If 1 supplier can not meet the demand of raw materials, then the company will contact other suppliers. 2. Cooperation between CV. Nicky Collection with customers in the form of product order request. Cooperation between CV. Nicky Collection with the delivery service is the process of delivery of products to customers submitted to the delivery service.
		Structure of information and communication flow facilities	1.Communication between CV. Nicky Collection with customers, suppliers and delivery services intertwined over the phone or with face-to-face direct come ker company. 2. Information with customers in the form of product ordering and information on product return. The company will contact the corresponding customer directly by telephone. 3. Information with suppliers in the form of demand for raw materials required. The company will contact the supplier directly by telephone. Information with delivery service in the form of delivery of finished products produced will be submitted to the delivery service. The company will contact the supplier directly by telephone.

2.7 Supply Chain Management Model in CV. Nicky Collection

Based on the SCM analysis described in the previous section as for the SCM model contained in the CV. Nicky Collection can be seen in figure 1.

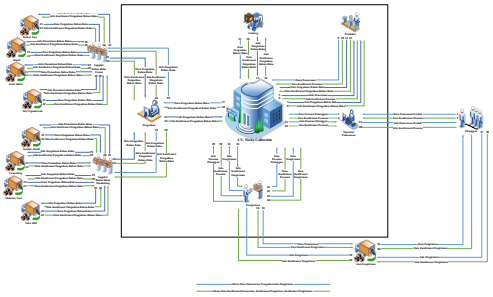


Figure 1 Supply Chain Management Model in CV. Nicky Collection

2.8 Stages of Supply Chain Management in CV. Nicky Collection

Management at CV. Nicky Collection Supply Chain Management at CV. Nicky Collection can be seen in figure 2

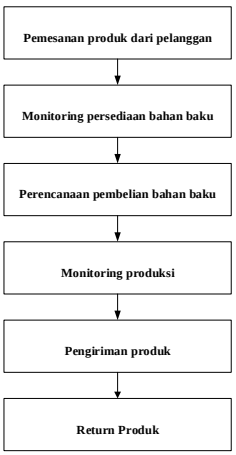


Figure 2 Stages of Supply Chain Management in CV. Nicky Collection

2.9 Product Ordering from Customers Analysis

In the ordering stage is between the customer with the Operator Booking Section, next Operator Booking Section will calculate the estimated order by the customer to be known when the completion of orders to customers. Here is the booking data for the December 2017 period at CV. Nicky Collection can be seen in table 2.

Table 2 Booking Data Period December 2017

Tanggal Pemesanan	Tanggal Uangmuka	Nama Pelanggan	Alamat	Jenis Produk	Nama Produk	Jumlah Pesan	Jumlah Total Pesanan	Jumlah yang harus dibayar	Uangmuka	Jenis Pengiriman	Tanggal Selesai
03/12/2017	03/12/2017	Benny Ahmad	Taves Residence Kav 10 JL Taves Dalam Asp Pasar Minggu, Jakarta	Celana	Celana Jeans Warna Biru Indigo	24	48	Rp 4,400,000	Rp 2,360,000	Dikirim	09/12/17
					Celana Jeans Warna Hitam Indigo	24					
03/12/2017	03/12/2017	Yundi Darmawan	JL Duri Mogot No.63A Bengkel Tetap Jaya Rt.05 Rw.01 Tanjung Duren Utara Grogol, Jakarta Barat	Kemeja	Kemeja Bengkel Warna Hijau	192	192	Rp 16,064,000	Rp 8,032,000	Dikirim	26/12/17
04/12/2017	04/12/2017	Yansaar	Darmo Indah Timur IV Blok D/18 Tandes, Surabaya	Jas	Jas Almamater Warna Biru	60	120	Rp 14,520,000	Rp 7,260,000	Dikirim	06/01/18
				Kemeja	Kemeja Kantor Warna Putih	60					

In Table 2 the booking data for the December 2017 period will be sampled for the estimated booking analysis.

Here is the calculation of booking estimate for the period of December 2017 at CV. Nicky Collection can be seen in the table 3.

Table 3 Calculation of Booking Estimates for the Period of December 2017

Tanggal Pemesanan	Tanggal Uang Muka	Nama Pelanggan	Nama Produk	Jumlah Pesan	Jumlah Total Pesanan	Tahapan Produksi	Jumlah Pekerja	Pengerjaan/ Orang	Hasil Produksi/ Hari	Lama Pengerjaan Hari	Tanggal Mulai Produksi	Tanggal Mulai Tahapan Produksi	Tanggal Selesai Tahapan Produksi	Tanggal Selesai Pesanan	Estimasi Pesanan
03/12/17	03/12/17	Benny Ahmad	Celana Jeans Warna Biru Indigo	24 Pcs	48 Pcs	Pemotongan Bahan	3 Orang	12 Pcs	3 x 12 = 36 Pcs	48 : 36 = 1 Hari	03/12/17	03/12/17	04/12/17	05/12/17	2 Hari
						Mengobat	3 Orang	12 Pcs	3 x 12 = 36 Pcs	48 : 36 =1 Hari		03/12/17	04/12/17		
			Celana Jeans Warna Hitam Indigo	24 Pcs		Pemasangan Aksesoris	3 Orang	12 Pcs	2 x 12 = 24 Pcs	48 : 24 = 2 Hari		03/12/17	05/12/17		
						Finishing	2 Orang	12 Pcs	2 x 12 = 24 Pcs	48 : 24 = 2 Hari		03/12/17	05/12/17		
03/12/17	03/12/17	Yundi Darmawan	Kemeja Bengkel Warna Hijau	192 Pcs	192 Pcs	Pemotongan Bahan	3 Orang	12 Pcs	3 x 12 = 36 Pcs	192 : 36 = 5 Hari	10/12/17	05/12/17	10/12/17	14/12/17	11 Hari
						Mengobat	3 Orang	12 Pcs	3 x 12 = 36 Pcs	192 : 36 = 5 Hari		05/12/17	10/12/17		
						Pemasangan Aksesoris	2 Orang	12 Pcs	2 x 12 = 24 Pcs	192 : 24 = 8 Hari		06/12/17	14/12/17		
						Finishing	2 Orang	12 Pcs	2 x 12 = 24 Pcs	192 : 24 = 8 Hari		06/12/17	14/12/17		
04/12/17	04/12/17	Yansaar	Jas Almamater Warna Biru	60 Pcs	120 Pcs	Pemotongan Bahan	3 Orang	12 Pcs	3 x 12 = 36 Pcs	120 : 36 = 10 Hari	11/12/17	11/12/17	21/12/17	25/12/17	21 Hari
						Mengobat	3 Orang	12 Pcs	3 x 12 = 36 Pcs	120 : 36 = 10 Hari		11/12/17	21/12/17		
			Kemeja Kantor Warna Putih	60 Pcs		Pemasangan Aksesoris	2 Orang	12 Pcs	2 x 12 = 24 Pcs	120 : 24 = 10 Hari		15/12/17	25/12/17		
						Finishing	2 Orang	12 Pcs	2 x 12 = 24 Pcs	120 : 24 = 10 Hari		15/12/17	25/12/17		

Based on table 3 it is explained that the booking estimate starts from the date of payment of the advance payment until the date of completion of the order. production start date adjusted to order queue and production stage.

Order estimation is made for production process is controlled and scheduled, so customers can know immediately when the product is done.

Here is the result of the estimated ordering of each customer ordering in the period of December 2017 can be seen in table 4.

Table 4 Estimated Booking Results Period December 2017

Tanggal Pemesanan	Tanggal Uang Muka	Nama Pelanggan	Nama Produk	Jumlah Pesan	Jumlah Total Pesanan	Tanggal Selesai Pesanan	Estimasi Pesanan
03/12/17	03/12/17	Benny Ahmad	Celana Jeans Warna Biru Indigo	24 Pcs	48 Pcs	05/12/17	2 Hari
			Celana Jeans Warna Hitam Indigo	24 Pcs			
03/12/17	03/12/17	Yundi Darmawan	Kemeja Bengkel Warna Hijau	192 Pcs	192 Pcs	14/12/17	11 Hari
04/12/17	04/12/17	Yansaar	Jas Almamater Warna Biru	60 Pcs	120 Pcs	25/12/17	21 Hari
			Kemeja Kantor Warna Putih	60 Pcs			
05/12/17	05/12/17	Alfin W	Jaket Parka Warna Hitam Army	96 Pcs	96 Pcs	30/12/17	25 Hari
07/12/17	07/12/17	Dea	Jaket Jeans Warna Hitam Naomi	108 Pcs	108 Pcs	04/01/18	28 Hari
11/12/17	11/12/17	Ahmad	Kemeja Bengkel Warna Hitam	96 Pcs	96 Pcs	09/01/18	29 Hari
11/12/17	11/12/17	Putra	Jaket Parka Warna Hitam	72 Pcs	72 Pcs	13/01/18	33 Hari
12/12/17	12/12/17	Adit Pratama	Celana Jeans Naomi Warna Hitam	292 Pcs	292 Pcs	26/01/18	45 Hari
12/12/17	12/12/17	Cholifah	Setelan Baju Dinas Warna Putih	84 Pcs	84 Pcs	31/01/18	50 Hari
12/12/17	12/12/17	Wahyudi	Celana Jeans Naomi Warna Hitam	200 Pcs	200 Pcs	08/02/18	59 Hari
13/12/17	13/12/17	Bagak Taya	Jaket Bomber Warna Hitam	89 Pcs	89 Pcs	14/02/18	63 Hari
14/12/17	14/12/17	Dolly	Jaket Harrington Warna Hitam	70 Pcs	70 Pcs	18/02/18	66 Hari

In table 4 is the result of the estimated booking period of December 2017. Estimation is done so that the completed date of order from customer can be known.

The following is the ordering of Black Naomi Jeans Pants for the period of December 2017 can be seen in table 5.

Table 5 Product Order Trousers Naomi Black Color Period December 2017

Customer's Name	Type of Products	Product name	Amount
Adit Pratama	Pants	Black Naomi Jeans Pants	292 pcs
Wahyudi	Pants	Black Naomi Jeans Pants	200 pcs

Table 5 details the number of Black Naomi Jeans Jeans product order for the period of December 2017. Customers on behalf of Adit Pratama ordered 292 pcs and customers on behalf of Wahyudi ordered 200 pcs, for the whole product of Black Naomi Jeans Pants in the period of December 2017 492 pcs.

2.10 Analysis of Raw Material Inventory Monitoring

Head of Warehouse will monitor the supply of raw materials in the warehouse and determine how safe the limits of raw materials that must be available in the warehouse to avoid shortages or out of stock in the warehouse using safety stock method.

Safety stock method is made on the raw materials included in the composition for the manufacture of certain products or commonly called the Bill of Materials (BOM).

Bill of Materials (BOM) is a list of items, raw materials, or materials needed to produce the final product.

The inventory analysis of raw materials BOM stages of a product that most ordered in the period of December 2017 that is the product of Black Naomi Jeans Black as much as 492 pcs.

Here is Bill of Material (BOM) for 1 Product of Black Naomi Jeans Pants can be seen in table 6 and table 7.

Tabel 6 Bill of Material (BOM) in stock for 1 Product of Black Naomi Jeans Pants Size 28 to 36

No	Raw Material Name	Amount	Unit
1.	Black Naomi Jeans Cloth	1,5	Meters

Tabel 7 Bill of Material (BOM) not in-stock for 1 Product Jeans Naomi Black Color Size 28 to 36

No	Raw Material Name	Amount	Unit
1.	Pocket Cloth	25	Cm
2.	Sewing Thread 40/2 Brand Black Goose World	1	Buah
3.	Obras Yarns Brands of Black World Swans	1	Buah
4.	Metal Zipper Size 15 Cm Brand YKK Color Black	1	Pcs
5	Metal Buttons Color Almunium	1	Buah
6.	Plastik OPP Size 30x40 Clear Color	1	Buah

Table 6 and Table 7 are Bill of Material (BOM) data of Black Naomi Jeans Pants selected based on the most booking data in the period of December 2017.

After knowing Bill of Material (BOM) for Black Naomi Jeans Jeans product that is 492 pcs, then the next step is to check availability of raw material stock in warehouse. The list of raw materials that have stock and list of raw materials that do not have stock in the warehouse will be described in table 8 and table 9.

The following is a list of the main raw materials stocked in the period of December 2017 can be seen in table 8.

Table 8 List of Raw Materials stocked in December 2017

No	Raw Name Material	Amount	Unit
1.	Black Naomi Jeans Cloth	200	Meter

In table 8 it is explained that there is 1 raw material as the main raw material in the stock that is Black Naomi Jeans Cloth. Available stock in warehouse December 2017 period is the Black Naomi Jeans Cloth as much as 200 meters.

Here is a list of non-stock support raw materials can be seen in table 9.

Table 9 List of Raw Material not in stock

No	Raw Name Material	Information
1.	Pocket Cloth	Booked on request
2.	Sewing Thread 40/2 Brand Black Goose World	Booked on request
3.	Obras Yarns Brands of Black World Swans	Booked on request
4.	Metal Zipper Size 15 Cm Brand YKK Color Black	Booked on request
5	Metal Buttons Color Almunium	Booked on request
6	Plastik OPP Size 30x40 Clear Color	Booked on request

In table 9 it is explained that there are 6 supporting materials that are not in-stock: Sewing Thread 40/2 Brand Black World Swan, Obras Yar Brand Black Swan World, Metal Zipper Brand YKK Black Color Size 15 Cm, Metal Color Metal Almunium and Plastic OPP Size 30x40 Clear Color. The procurement of raw material supporting the pengadaanya done when there is order from customer.

Here is a detailed list of raw material requirements for 492 pcs of Black Naomi Jeans Pants can be seen in table 10.

Table 10 Detailed List of Raw Material Requirements For 492 Pcs Product Black Naomi Jeans Pants

Produc r	Numbe r of Product	Raw Material Name	Number of Raw Material Needs	Raw Material Invetory
Black Naomi Jeans Pants	492 pcs	Pocket Cloth	492 x 1,5 = 738 Meters	200 Meters
	492 pcs	Sewing Thread 40/2 Brand Black Goose World	492 x 25 = 12300 Cm = 123 Meters	-
	492 pcs	Obras Yarns Brands of Black World Swans	492 x 1 = 492 Buah	-
	492 pcs	Metal Zipper Size 15 Cm Brand YKK Color Black	492 x 1 = 492 Buah	-
	492 pcs	Metal Buttons Color Almunium	492 x 1 = 492 Pcs	-
	492 pcs	Plastik OPP Size 30x40 Clear Color	492 x 1 = 492 Buah	-
	492 pcs	Pocket Cloth	492 x 1 = 492 Buah	-

Table 10 describes the calculation of raw material of Black Naomi Jeans Pants for 492 pcs from product order for the period of December 2017. The calculation is the amount of product x with the amount of raw material needed for 1 Black Naomi Jeans Pants product obtained from Bill of Material (BOM) in table 6 and table 7.

Having known the amount of raw material required, then next is to calculate the value of safety stock for each raw material ordered. Raw materials calculated value of safety stock is raw materials that have stock, not applicable to raw materials that do not have stock.

Example of safety stock calculation for December 2017 period:

1. The number of ordering raw materials of Black Naomi Jeans Cloth of 738 meters obtained from the calculation of raw material requirement in table 9.
   Number of days in December = 31 days
   Lead time procurement of raw materials to suppliers = 2 days
   Resolution:
   Safety stock for raw materials Black Naomi Jeans Cloth calculation (738/31) x2 = 47.61 = 48 meters
   so the value of safety stock obtained for raw materials Black Naomi Jeans Cloth is as much as 48 meters.

After the calculation of safety stock, then the next step is to monitor the supply of raw materials by comparing the raw materials required.

Here is a list of monitoring supplies of raw materials Trousers Naomi Black Color can be seen in table 11.

Table 11 List of Monitoring of Raw Materials Supply of Black Naomi Jeans

Nama Bahan Baku	Jumlah Kebutuhan Bahan Baku	Persediaan Bahan Baku	Safety Stock	Status Persediaan
Kain Jeans Naomi Warna Hitam	738 Meter	200 Meter	48 Meter	Persediaan tidak aman

Table 11 describes the monitoring list of Trousers Naomi Jeans Black Color indicates the status of unsafe inventory because the required raw materials exceed the existing stock of raw materials in the warehouse.

2.11 Analysis of Raw Material Purchase Planning

The Head of Procurement Division will calculate the procurement of raw materials from the most ordered customer order data in the December 2017 period, the Black Naomi Jeans Pants, the safety stock value and the amount of existing stock in the warehouse, as well as calculating the ordering cost and storage cost in order to minimize the cost economically possible by using the Economic Order Quantity (EOQ) method.

Here is a list of raw material purchase plans for Black Naomi Jeans Pants can be seen in table 12.

Table 12 List of Material Purchase Plan For Black Naomi Jeans Pants Products

No	Nama Bahan Baku	Jumlah Kebutuhan Bahan Baku	Persedi aan Bahan Baku	Safety Stock	Rencana Pembelian
1.	Kain Jeans Naomi Warna Hitam	738 Meter	200 Meter	48 Meter	738 + 48 – 200 = 586

Table 12 describes the plan to purchase raw materials for Black Naomi Jeans Pants with a comparison of safety stock by calculating the raw material requirement + safety stock - raw material inventory in the warehouse, so the purchase plan of Black Naomi Jeans Cloth is 586 meters.

Purchase of raw materials is done when the amount of raw materials required amount more than the existing raw materials in the warehouse by looking at the safety stock value as an eventual. If there are raw materials that do not have a safety stock value, then the raw material is included in the category of raw materials that do not have stock.

1. Inventory Counting Method
   Every time there is an order from the customer needs to be calculated on the existing variables.
   Here are the required variable calculations:
   a. Booking Fee
      Ordering Cost is the cost associated with getting the raw material from the supplier.
      The total order cost in 1 month is 780,000. For the frequency of ordering of raw materials to the supplier occurs if there is a product order from the customer. Can be assumed if ordering of raw material to supplier could happen every day, so that in 1 period of December 2017 could be 26x ordering.
      S = Total booking fee / Order frequency
      = Rp.780.000 / 26
      = Rp.30.000
      Information :
      S = Booking fee every time a message
   b. Storage Fee
      The cost of storage (Carrying cost / Holding cost) is the cost that arises because the company keeps inventory. 1 month storage fee of 700,000. As for the total requirement of raw materials obtained from total product demand divided by the ordering frequency are: H = Total storage cost / Total product requirement So the calculation results obtained for the overall storage costs in table 13.

Table 13 List of Total Storage Costs

No	Nama Bahan Baku	Kebutuhan	Biaya Simpan
1.	Kain Saku	123 Meter	H = 700000 : 123 = 5691,05 = Rp.5700
2.	Benang Jahit 40/2 Merek Angsa Dunia Warna Hitam	492 Buah	H = 700000 : 492 = 1422,76 = Rp.1500
3.	Benang Obras Merek Angsa Dunia Warna Hitam	492 Buah	H = 700000 : 492 = 1422,76 = Rp.1500
4.	Metal Zipper Ukuran 15 Cm Merek YKK Warna Hitam	492 Pcs	H = 700000 : 492 = 1422,76 = Rp.1500
5.	Kancing Metal Warna Almunium	492 Buah	H = 700000 : 492 = 1422,76 = Rp.1500
6.	Plastik OPP Ukurang 30x40 Warna Bening	492 Buah	H = 700000 : 492 = 1422,76 = Rp.1500

After the cost of ordering raw materials and storage costs is calculated into the total cost of raw material storage, the next process is the purchase of raw materials. The purchase of raw materials to suppliers will be used using the Economic Order Quantity (EOQ) method so that the purchase of raw materials to the supplier can be as economical as possible.

2. Method of Economic Order Quantity (EOQ)
   Having known the things as to be calculated above, the amount of raw material purchases are economical using the EOQ method.

Table 14 EOQ Calculation Results

No	Nama Bahan Baku	Pembelian	Jumlah	Waktu Antar Pemesanan	Frekuensi Pemesanan
1.	Kain Saku	$\frac{\sqrt{2 \times 123 \times 300}}{5700}$ = 1294,73 = $\sqrt{1294,73}$ = 35,98	36 Meter	= Q/D = 36/123 = 0,29/Bulan = 0,29 x 26 Hari = 7,6 = 8 Hari	= D/Q = 123/36 = 3,41 = 3 Kali/Bulan

In table 14 the Economic Order Quantity (EOQ) calculation describes a simple model that can be used to determine the size of an economical order. This model considers two inventory costs - the cost of messages and the cost of saving. The cost of the message in question is the fixed fee that comes out every time the reservation is made and does not depend on the size or volume of the order. While the cost of save is the cost incurred due to the company stores the product for a certain period. Therefore, the calculation of EOQ for example a calculation is the purchase of pocket fabric.

2.12 Analysis of Production Monitoring

The analysis of production monitoring to be determined in the production process as production targets that must be completed in

an order product and production production aims to monitor the production status whether it is being processed or already completed.

Here is the monitoring of production activities in CV. Nicky Collection can be seen in table 15.

Table 15 Monitoring of Production Activities

Tanggal Pemesanan	Nama Pelanggan	Nama Produk	Jumlah Pesan	Jumlah Total Pesanan	Tanggal Mulai Produksi	Tanggal Selesai Pesanan	Status Produksi
03/12/17	Benny Ahmad	Celana Jeans Warna Biru Indigo	24 Pcs	48 Pcs	03/12/17	05/12/17	Selesai
		Celana Jeans Warna Hitam Indigo	24 Pcs				
03/12/17	Yundi Darmawan	Kemeja Bengkel Warna Hijau	192 Pcs	192 Pcs	05/12/17	14/12/17	Selesai
04/12/17	Yanuar	Jas Almamater Warna Biru	60 Pcs	120 Pcs	11/12/17	25/12/17	Selesai
		Kemeja Kantor Warna Putih	60 Pcs				
05/12/17	Afin W	Jaket Parka Warna Hijau Army	96 Pcs	96 Pcs	22/12/17	30/12/17	Selesai
07/12/17	Dea	Jaket Jeans Warna Hitam Naomi	108 Pcs	108 Pcs	26/12/18	04/01/18	Selesai
11/12/17	Ahmad	Kemeja Bengkel Warna Hitam	96 Pcs	96 Pcs	30/12/18	09/01/18	Selesai
11/12/17	Putra	Jaket Parka Warna Hitam	72 Pcs	72 Pcs	03/01/18	13/01/18	Selesai
12/12/17	Adit Pratama	Celana Jeans Naomi Warna Hitam	292 Pcs	292 Pcs	06/01/18	26/01/18	Selesai
12/12/17	Cholifah	Setelan Baju Dinas Warna Putih	84 Pcs	84 Pcs	15/01/18	31/01/18	Selesai
12/12/17	Wahyudi	Celana Jeans Naomi Warna Hitam	200 Pcs	200 Pcs	18/01/18	09/02/18	Selesai
13/12/17	Bapak Yaya	Jaket Bomber Warna Hitam	89 Pcs	89 Pcs	25/01/18	14/02/18	Selesai
14/12/17	Dolly	Jaket Harrington Warna Hitam	70 Pcs	70 Pcs	28/01/18	18/02/18	Selesai

In table 15 monitoring of production activities, there are 2 status of production process. This production status consists of "Done" and "Process" statuses.

2.13 Product Delivery Analysis

Shipping scheduling activities can be determined by looking at which product order is ready to be shipped. The following list of product delivery period of December 2017 can be seen in table 16.

Table 16 List of Product Delivery Period December 2017

Tanggal Pemesanan	Nama Pelanggan	Alamat Pelanggan	Nama Produk	Jumlah Pesan	Jumlah Total Pesanan	Tanggal Selesai Pesanan	Tanggal Pengiriman	Status Pesanan
03/12/17	Benny Ahmad	Tawes Residence Kav 10 Jl. Tawe Dalam Aup Pasar Minggu, Jakarta	Celana Jeans Warna Biru Indigo	24 Pcs	48 Pcs	05/12/17	06/12/17	Selesai
			Celana Jeans Warna Hitam Indigo	24 Pcs				
03/12/17	Yundi Darmawan	Jl. Daat Mogot No.63A Bengkel Tetap Jaya Rt.05 Rw.01 Tanjung Duren Utara Grogol, Jakarta Barat	Kemeja Bengkel Warna Hijau	192 Pcs	192 Pcs	14/12/17	15/12/17	Selesai
04/12/17	Yanuar	Darmo Indah Timur IV Blok D/18 Tandes, Surabaya	Jas Almamater Warna Biru	60 Pcs	120 Pcs	25/12/17	26/12/17	Selesai
			Kemeja Kantor Warna Putih	60 Pcs				
05/12/17	Afin W	Jl. Jend Sudirman 93A, Cilacap Selatan	Jaket Parka Warna Hijau Army	96 Pcs	96 Pcs	30/12/17	31/12/17	Selesai

Table 16 describes the delivery list for December 2017 period. Items will be sent to customers using a shipping service. Delivery service selected so far in CV. Nicky Collection to send products to customers using JNE delivery service.

Here is the schedule of product delivery can be seen in table 17.

Table 17 Product Delivery Scheduling

Tanggal Pengiriman	Nama Pelanggan	Alamat Pelanggan	Nama Produk	Jumlah Pesan	Jumlah Total Pesanan	Status Pembayaran	Jasa Pengiriman	Nomor Resi
06/12/17	Benny Ahmad	Tawes Residence Kav 10 Jl. Tawe Dalam Aup Pasar Minggu, Jakarta	Celana Jeans Warna Biru Indigo	24 Pcs	48 Pcs	Lunas	JNE	020462345728417
			Celana Jeans Warna Hitam Indigo	24 Pcs				
15/12/17	Yundi Darmawan	Jl. Daat Mogot No.63A Bengkel Tetap Jaya Rt.05 Rw.01 Tanjung Duren Utara Grogol, Jakarta Barat	Kemeja Bengkel Warna Hijau	192 Pcs	192 Pcs	Lunas	JNE	020701634424217
26/12/17	Yanuar	Darmo Indah Timur IV Blok D/18 Tandes, Surabaya	Jas Almamater Warna Biru	60 Pcs	120 Pcs	Lunas	JNE	020570424297117
			Kemeja Kantor Warna Putih	60 Pcs				
31/12/17	Afin W	Jl. Jend Sudirman 93A, Cilacap Selatan	Jaket Parka Warna Hijau Army	96 Pcs	96 Pcs	Lunas	JNE	020424254278947

Monitoring process contained in the system to be created can be seen in table 18.

Table 18 List of Product Delivery Process Period December 2017

Tanggal Pengiriman	Nama Pelanggan	Alamat Pelanggan	Nama Produk	Jumlah Pesan	Jumlah Total Pesanan	Jasa Pengiriman	Nomor Resi	Status Pengiriman
06/12/17	Benny Ahmad	Tawes Residence Kav 10 Jl. Tawe Dalam Aup Pasar Minggu, Jakarta	Celana Jeans Warna Biru Indigo	24 Pcs	48 Pcs	JNE	020462345728417	Diterima
			Celana Jeans Warna Hitam Indigo	24 Pcs				
15/12/17	Yundi Darmawan	Jl. Daat Mogot No.63A Bengkel Tetap Jaya Rt.05 Rw.01 Tanjung Duren Utara Grogol, Jakarta Barat	Kemeja Bengkel Warna Hijau	192 Pcs	192 Pcs	JNE	020701634424217	Diterima
26/12/17	Yanuar	Darmo Indah Timur IV Blok D/18 Tandes, Surabaya	Jas Almamater Warna Biru	60 Pcs	120 Pcs	JNE	020570424297117	Diterima
			Kemeja Kantor Warna Putih	60 Pcs				
31/12/17	Afin W	Jl. Jend Sudirman 93A, Cilacap Selatan	Jaket Parka Warna Hijau Army	96 Pcs	96 Pcs	JNE	020424254278947	Diterima

2.14 Product Return Analysis

The Company has a policy of overcoming product returns for 1 week after the product is received. Section Operator Booking will record any complaints return from customers. Records of returns and returns will be submitted to the Head of Production Division for improvement.

Here is the product return data from customers from May to October 2017 at CV. Nicky Collection can be seen in table 19.

Table 19 Product Return Data From Customers Period in May to October 2017

Tanggal Return	Nama Pelanggan	Nama Produk	Jumlah Return	Keluhan Return
06-05-2017	Gilar R	Jas Almamater Warna Biru	3	Produk jahitannya kurang rapih.
25-06-2017	M Ariefin	Kemeja Slimfit Warna Navy	12	Pemasangan kancing kurang rapih dan mudah copot.
04-08-2017	Tarkimian	Jaket Harrington Warna Hitam	5	Produk resleting macet.
15-10-2017	Ratna	Kemeja Bengkel Warna Hitam	6	Salah satu bordiran yang diminta belum terpasang.

2.15 Database Analysis

Database analysis on the information system to be built using ERD. The diagram is illustrated in Figure 3.

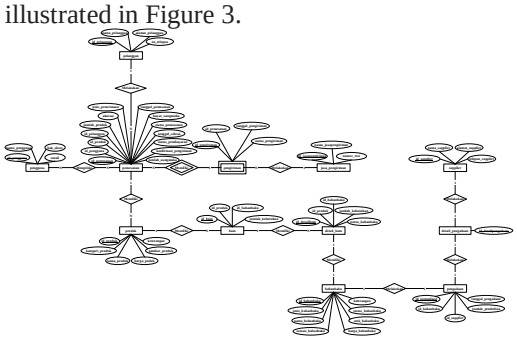


Figure 3 Entity Relationship Diagram (ERD)

2.16 Diagram Konteks

Context diagram is a model to explain globally how data is used and transformed for the process of describing the flow of data into and out of the system. Context diagram on this system can be seen in figure 4.

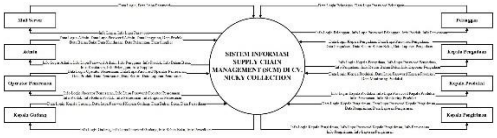


Figure 4 Diagram Konteks

2.17 Table Relation

The relations table describes the relationship between the data, the meaning of the data and its limitations. Table relation is described in figure 6.

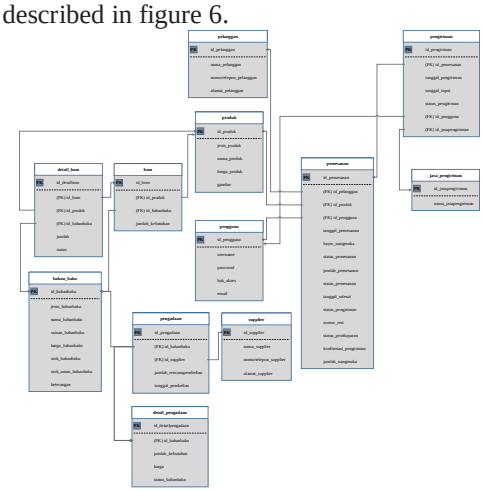


Figure 6 Table Relation

2.18 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. Designing Supply Chain Management interface in CV. Nicky Collection will be discussed as follows:

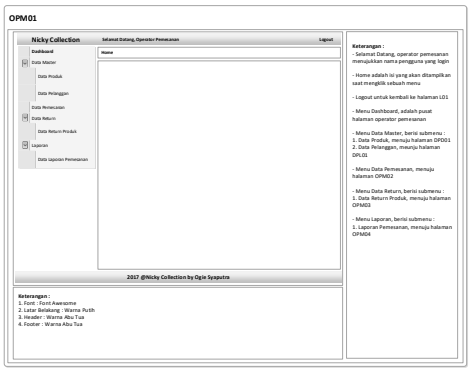


Figure 10 Designing the Operator Interface

The design of the Warehouse Heads section interface can be seen in Figure 11.

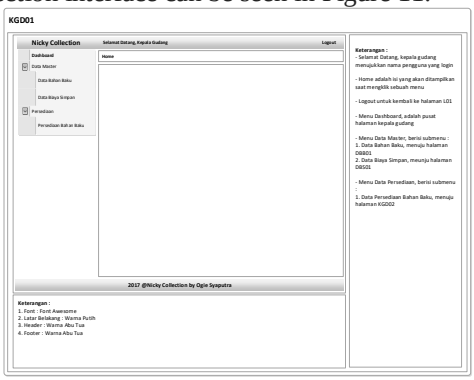


Figure 11 Interface Design of Warehouse Section

The interface design of the Procurement Section Head can be seen in Figure 12.

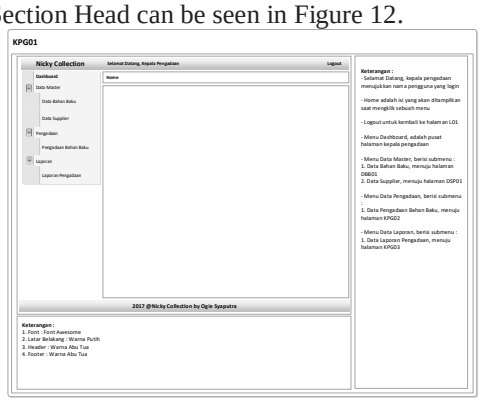


Figure 12 Interface Design Head of Procurement Section

Designing interface Head of Production Department can be seen in picture 13.

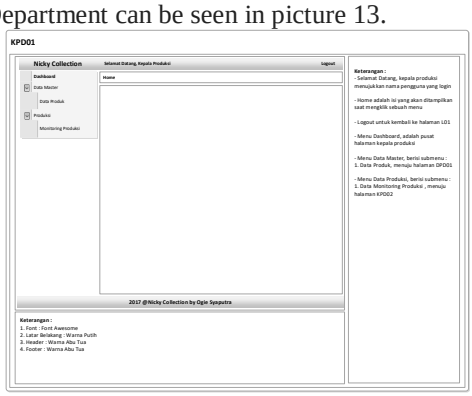


Figure 13 Interface Design Head of Production Section

The design of the Section Head Delivery interface can be seen in Figure 14.

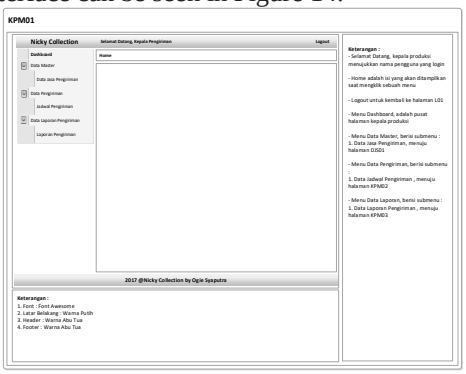


Figure 14 Interface Design of Shipping Section Head

2.19 Conclusion Blackbox Testing

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

2.20 Conclusion Beta Testing

1. This built information system can facilitate Section Operator Booking in processing the process of ordering products from customers.
2. The information system built this can facilitate the Head of Warehouse in monitoring raw material inventory in the warehouse.
3. Information system built this can facilitate the Head of Procurement Division in determining the amount of procurement of raw materials ordered to suppliers.
4. This built information system can facilitate the Head of Production in monitoring the products that are in the process of work and finished products done.
5. This built information system can facilitate the Head of Shipping in determining the delivery schedule.

3. COVER

3.1 Conclusion

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

1. This built information system can facilitate the operator's part of the order in processing the process of ordering products from customers and can mambantu do the calculation of the estimated completion of orders to be informed to customers, but the system has not been able to display the estimated calculation of completion of the order as a whole because some processes are still not in accordance with calculation.
2. Information system built can facilitate the head of procurement in determining the amount of procurement of raw materials ordered to the supplier, but the system has not been able to facilitate overall because some of the existing processes on the system not yet appropriate.
3. Information systems built can facilitate the delivery of the delivery department in determining the delivery schedule of products to customers is to see which product orders are ready to be sent.

3.2 Suggestion

Suggestions for the development of this supply chain system are some suggestions that can be done, among others:

1. Need a better development and maintenance of the system that has been built, so the system can be used in accordance with the needs of the future.
2. Further research is expected that the built system can display the estimated calculation of completion of the order and can facilitate in determining the total procurement of raw materials as a whole.

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