# DEVELOPING INFORMATION SYSTEM OF PRODUCT CONTROLLING AT CV. KAOSKOSONG USING SUPPLY CHAIN MANAGEMENT METHOD

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## ABSTRACT

CV. Kaoskosong is a company in convection field in producing t-shirt. The strategy used in its business process is make-to-stock, which company produces in a big number to anticipate costumers' demand. Problems always appear in the material stocking process because the manager did not predict the amount of materials ordered especially the fabric used in the production because sometimes it was out of stock. During distribution process, the head of warehouse did not decide the transportation used to bring stocks to the branch office and he could not find any stock in the branch office.

SCM (Supply chain Management) is applied to handle the needs of the company so the stock will always be available to be marketable to the customers. One way to handle it, is to maintain the needs of the company by always predict the needs of the company. Single Moving Average method is used to calculate the average of selling transaction data available and the calculation result is used as the consideration of product amount. The prediction result can also be handled if there is an error found using safety stock.

SCM application is developed and used to control the product in maintaining the availability of the product and materials. It is also used as the distribution schedule to the branch office. Based on the Blackbox test and interview result, it can be concluded that SCM application developed can facilitate the manager to maintain the availability of the product and the materials also helping the head of the warehouse to make a distribution schedule to the branch office.

Keywords: CV. Kaoskosong, Distributing, Predicting, Procurement, SCM

## 1. PENDAHULUAN

CV. Kaoskosong is a company engaged in the convection that was established in 2014 which produces a plain shirt, shirt raglan plain, and a plain shirt rainbow with many colors such as black, white, red, green, and others, and black is the color that is much in demand consumer. Supply chain processes currently running on the CV. Kaoskosong originated from upstream to downstream. Upstream activities include demand / raw material procurement, receipt of raw materials to processing raw materials into products shirt, while the downstream activities include ordering products from consumers and the distribution was to the branch. CV. Kaoskosong had 3 convection (production) and the first places to check the condition of the product before entering the barn CV. Kasokosong. The process that occurs in convection and places to check include memola fabric, cut fabric, sewing fabric and paired the label, and then checking the waste yarn, ironing products (steam), until the final check and packaging. Stages of production is done during office hours starting from 08.00 until 17.00 every day except Sundays and red date calendar, assisted by two cutting machines (cut materials) and 30 sewing machine but to place the checks carried out in 24 hours divided into 2 shifts; morning and dinner with the overall number of employees of 16 people (4 people in parts of steam, waste yarn section 6, and 6 section folding and packing). Bookings made consumers can be done at the central warehouse CV. Kaoskosong or in branch CV. Kaoskosong. Branches owned CV. Kaoskosong much as 7 branches spread dibandung them, KKHQ, Polos Ngideur, Polosbdg, Mamessa Combed Cotton, Polosbossku, Kade, and Kaoskosong_plg and has two assets of the vehicle, motorcycles and cars that are used to distribute the products to the branch and to deliver products to customer orders for services delivery.

In interviews with the manager CV. Kaoskosong that Mr. Vicky, strategies used in business processes is make-to-stock, starategi is used to anticipate the demand for the product from consumers. The results of products manufactured in the convection will be stored in the central warehouse CV. Kaoskosong. A day entrance to the central warehouse products can reach more than 2000 pcs of all colors and types. Black product is a product that most consumers demand. This was confirmed from the results of the data contained in Appendix consumer bookings, and therefore companies often anticipate that by

producing a black shirt in large numbers around approximately 1000 pcs per day. Ordering raw materials such as fabric is determined through a decision manager by order directly to the supplier. Booking products by consumers is uncertain, it resulted when ordering raw materials in small quantities when the company suffered a shortage for large orders was sometimes a two-party suppliers of raw materials cloth booked experiencing vacancy so that the CV. Kaoskosong have to wait for approximately 7 days until the raw materials ordered fabric available, but when ordering raw materials in large quantities sometimes companies do buildup of raw materials in the warehouse convection and accumulation of finished products in the central warehouse and branch CV. Kaoskosong. This can result in lost customers when consumers want products that are not available in the CV. Kaoskosong.

Based on the interview with the Head of the warehouse, Mr Waluyo, from the products that enter the range from approximately 2000 pcs to the central warehouse then 65% of the products that go into the central warehouse to be stored for CV sales. Kaoskosong and 35% of the incoming product will be distributed to seven branches. Booking consumers conducted by ordering via resellers / phone / sms / phone or social media CV. Kaoskosongan will ship the products to the delivery service at the time the company closed or close order at 17.00. Delivery to the branch will be conducted each product entered the warehouse number around 1000 pcs conducted at 09.00 every weekday and delivery to consumers are conducted every weekday. Matic delivery using a motor with a capacity of 300 pcs and for pickup. Constraints experienced in the distribution is the current distribution to the branches, head of the warehouse did not specify vehicle used to carry products to the branch and the head of the warehouse does not see the stock in branches. When the products are distributed in large quantities courier staff should distribute the Dapa mengakibaykan repeatedly increases the cost of distribution and when it does not see the stock in the branch, the branch berakhibat product buildup.

Based on the issues raised in the CV. Kaoskosong it is necessary to build a system that can control products, monitoring the inventory of raw materials, scheduling and determining the number of products for distribution to branch using supply chain management. Supply chain management is used for forecasting can be considered to determine the number of products for the production in order to estimate consumer permesanan can be handled. Companies providing security so that when the supply of raw materials of high consumer demand, the products are always available to be marketed.

### 1.1 Informastion System

The information system is a system within an organization reconcile the needs of daily transaction processing, support the operation, managerial and strategic activities of an organization and provide certain outside parties with the necessary reports [1].

### 1.2 Supply Chain Management (SCM)

Supply chain is a network of companies that jointly work to create and deliver a product into the hands of end users. Such companies typically include suppliers, manufacturers, distributors, stores or retail, as well as companies support such as logistics services company [2].

In a supply chain there are usually three kinds of streams that must be managed. The first is the flow of goods flowing from upstream to hili. The second is the flow of money and the like that flow from downstream to upstream. The third is the flow of information that can occur from upstream to downstream or vice versa. Information about the product inventory remaining in each supermarket is often required by the distributor or manufacturer. Information about the availability of capacitance of production are owned by the supplier is also often required by the plant. Information about the status of delivery of raw materials are often required by the company that sent or will receive. The shipping company must share information like this so that interested parties can monitor for the benefit of more accurate planning [2].




Figure 1 Supply Chain Model Simplification and 3 Piece Flow Managed

Supply Chain Management is the method used for coordination and collaboration among companies in the supply chain for companies that are in a supply chain is essentially want to satisfy consumers the same end, they must work together to make a cheap product, deliver it on time, and with good quality [2].

#### 1.2.1 Public Understanding Forecasting

Forecasting (forecasting) are predictive values of a variable based on the known value of the variable or variables related. Predict can also be based on skills assessment, which is in turn based on historical data and experience [3].

### 1.2.2 Forecasting Techniques

The following is a discussion of some of the forecasting techniques that will be used in the preparation of this thesis.

1. Single Moving Average

Single moving average method uses an average of all the data forecasting. Moving averages are more used to predict the next period. The formula for a single moving average can be seen in equation 1.

$$Y_{t+1} = \frac{Yt + Yt-1 + _ + Yt-k+1}{k} \quad (1)$$

Where:

$Y_{t+1}$ = value forecasting for the next period
$Y_t$ = actual value / actual in period t
K = number of treatments in the moving average

Moving average for the time period t is the arithmetic mean of the latest k observation. In a moving average, a given load equal to each observation. Each new data included in the average available, and the earliest data is discarded. This model does not deal with the trend or seasonally very well. Although it was better than the simple average method [4].

### 1.2.3 ROP (Reorder Point) and Safety Stock

The situation with the uncertainty of safety stock required to reduce the possibility of shortages of the goods in question. Lead time making the company must determine the time of booking for a reordering of goods should consider two aspects of uncertainty in lead time and demand. Time reordering is often manifested in the form of value Reorder Point [2].

Security or safety stock inventory serves to protect the error in predicting demand during lead time. Inventories security will function if the actual demand is greater than the average value. How to get an idea of how uncertain demand during the lead time, companies need to collect data to gain distribution [2].

The formula for ROP and safety stock can be seen in equation 3.

ROP = d x l + safety stock (3)

keterangan:

d = Demand Average Per Period
l = Lead Time

Where the value of safety stock searchable with different formula and the formula can be seen in Equation 4.

Safety Stock = Z x $S_{dl}$ (4)

Information:

Service Level Z = 1.645 = NORMSINV 95% (A company's ability to service requests or translated from management decisions)
Sdl = Standard Deviation Request For Lead Time
sl = Standard Deviation Lead Time
sd = Standard Deviation Requests Per Period

Sdl value determined from ketidakpatian demand uncertainty and lead time provided it can be seen in Figure 2.

| variabel | konstan | variabel |
|---|---|---|
| **Permintaan** | Sdl = Sd x $\sqrt{(l)}$ *Safety Stock* ditentukan oleh ketidakpastian permintaan. | Sdl = $\sqrt{(d^2 \text{ x } St^2 + l \text{ x } sd^2}$ *Safety Stock* ditentukan oleh interaksi dua ketidakpastian. |
| konstan | Tidak diperlukan *safety stock*, situasi deterministik ($S_{dl}$ = 0). | Sdl = d x sd *Safety Stock* ditentukan oleh ketidakpastian *lead time*. |
| | ***Lead Time*** | |

Figure 2 Interaction between demand and lead time on the determination of safety stock

$$1 \text{ s } 1 \quad (2.2)$$

## 2. CONTENTS OF RESEARCH

### 2.1 Problem Analysis

Analysis of the problem is an assumption of the issues that will be described in the procedure - data processing procedures on the program that will be built. Analysis of the problem of the system running are:

1. The uncertainty surrounding consumer interest in the product order lead manager is difficult to determine the number of products to stock next week and the amount of raw materials ordered from suppliers to supply.
2. Seeing the stock is branched and determine the types of vehicles for distribution resulted in accumulation of less desirable products at distribution branches and waste.

### 2.2 Analysis Method Of Supply Chain Management

Methods of supply chain management has a supply chain management framework consists of three elements are interlinked with each other, namely:

1. Structure of the supply chain network, the network of members and relationships with other members of the supply chain from starting supplier to the hands of the user (consumer).
2. The process of business supply chain, ie activities that produce a specific output value for the consumer.
3. Components of supply chain management, the managerial variables which business processes together and arranged along the supply chain.

Table 1 Decomposition Element Framework Supply Chain ManagementManagement

| No | Elemen Kerangka Kerja | Sub elemen Kerangka kerja | Penerapan dalam penelitian |
|---|---|---|---|
| 1 | Struktur Jaringan *supply chain* | Struktur vertical | Hubungan internal antara :<br>1. *Front Office& Cashier*<br>2. *Manager*<br>3. Kepala gudang<br>4. Cabang CV Kaoskosong<br>Hubungan eksternal antara :<br>1. *supplier*<br>2. konsumen |
| | | Posisi horizontal perusahaan | CV. Kaoskosong berada pada posisi sebagai sumber supply untuk para konsumen dan cabang CV. Kaoskosong maupun sebagai konsumen untuk para *supplier*. |
| 2 | Proses bisnis *supply chain* | *Demand Management* | Mengelola Pemesanan yang dilakukan oleh konsumen |
| | | *Procurement* | 1. Proses permintaan bahan baku ketika produk mengalami kekosongan.<br>2. Proses permintaan bahan baku jika ada pesanan konsumen lebih dari 1000 pcs. |
| | | *Distribution* | Mengirimkan produk untuk cabang CV. Kaoskosong. |
| 3 | Komponen *management supply chain* | Metode peramalan dan pengendalian | Meramalkan persediaan produk untuk minggu selanjutnya oleh *manager* serta pengamanan produk agar saat mengalami peningkatan pemesanan produk selalu tersedia. |
| | | Struktur aliran kerja / aktivitas kerja | Kerja sama antara CV. Kaoskosong dengan konsumen, CV. Kaoskosong dengan *supplier*. |
| | | Struktur fasilitas aliran komunikasi dan informasi | Komunikasi dan informasi antara CV. Kaoskosong konsumen dan *supplier* terjalin lewat telepon dan bertemu langsung. |

Based on the analysis of supply chain management is done before mapping the components involved with CV. Kaoskosong which can be seen in Figure 3:

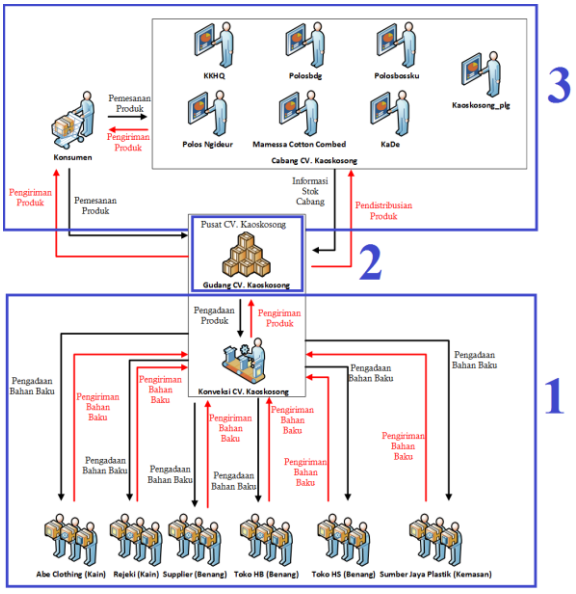



Figure 3 Mapping HR CV. Kaos Blank

Information :

Table 2 Description Mapping SCM CV. Kaoskosong

| Proses | Keterangan |
|---|---|
| 1 | CV. Kaoskosong menggunakan pendekatan *push supply chain* atau disebut juga *make to stock* pada sistem produksinya yaitu dengan cara memproduksi produk sebelum adanya pemesanan dari konsumen dan untuk persediaan stok di gudang oleh karena itu proses produksi di CV. Kaoskosong sangat dipengaruhi oleh adanya persediaan bahan baku.<br>Tahap dalam rantai pasok CV. Kaoskosong ini dimulai dari pengadaan bahan baku dengan cara kepala gudang mengajukan surat pengadaan produk, lalu *manager* akan memesan bahan baku untuk memproduksi produk yang telah diajukan kepala gudang ke *manager*. Bahan baku yang dipesan lalu akan dikirim oleh *supplier* langsung ke tempat konveksi untuk diproduksi sesuai ke surat jalan yang dibuat oleh *manager*. Tempat konveksi ini terdiri dari 3 tempat produksi dan 1 tempat pengecekan yang mana 3 tempat produksi melakukan potong bahan hingga penjahitan dan hasil dari tempat produksi akan dikirim ke tempat pengecekan untuk dilakukan pengecekan hingga pengemasan sebelum masuk ke gudang CV. Kaoskosong. |
| 2 | Data pemesanan yang didapat oleh CV. Kaoskosong dapat memanfaatkannya untuk melakukan monitoring persediaan produk kaos untuk mengetahui stok aman produk di CV. Kaoskosong, pengendalikan produk agar tidak terjadi kekurangan atau kekosongan saat pemesanan meningkat, monitoring pengiriman ke cabang agar stok di cabang tidak menumpuk. Tahapan yang dilakukannya adalah dengan menggunakan metode *safety stock* untuk mengamankan produk agar ada batas aman, teknik peramalan untuk memperkirakan jumlah yang akan diproduksi untuk memperkirakan pemesanan konsumen, penjadwalan distribusi untuk mengetahui stok di cabang agar sebelum pengiriman pihak CV. Kaoskosong sudah mengetahui stok di cabang dan tidak terjadi penumpukan produk di cabang lalu penentuan kendaraan untuk pengiriman agar tidak terjadi pemborosan dalam pengiriman |
| 3 | Sebagian produk yang telah diproduksi di konveksi akan didistribusikan ke cabang dan sebagian lainya akan disimpan di gudang pusat CV.Kaoskosong maka konsumen dapat memesan produk di pusat CV.Kaoskosong maupun di cabang. Saat proses pendistribusian ke cabang, pada proses sebelumnya CV.Kaoskosong akan mendistribusikan produknya dalam jumlah merata ke cabang. Hal tersebut dapat mengakibatkan penumpukan disalah satu cabang ketika pemesanan produk di cabang ada yang mengalami penurunan. Solusi yang akan disisipkan pada sistem yang akan dibangun maka kepala gudang dapat memonitoring terlebih dahulu produk di cabang lalu akan menentukan jumlah produk yang akan didistribusikan ke setiap cabang. Konsumen dapat melakukan pemesanan secara datang langsung ke cabang atau pusat, dapat pula melakukan pemesanan via *reseller*/telepon/sms/telepon atau media sosial dan produk yang dipesan akan dikirim melalui jasa pengiriman seperti JNE, POS, dan lain-lain. |

### 2.2.1 Forecasting Analysis Products

One stage in the analysis of supply chain management are the stages of analysis forecasting for the procurement of information flow. Forecasting calculations using booking data product a few weeks earlier with data from plain black T-shirt booking date of October 1, 2015 until December 23, 2015 per week. Recapitulation data ordering a plain black T-shirt dated October 1, 2015 until December 23, 2015 per week can be seen in Table 3.

Table 3 Summary of Booking Kaos Polos Color Black

| Tanggal | Jumlah |
|---|---|
| 01 Okt - 07 Okt 2015 | 775 |
| 08 Okt - 14 Okt 2015 | 1489 |
| 15 Okt - 21 Okt 2015 | 656 |
| 22 Okt - 28 Okt 2015 | 809 |
| 29 Okt - 04 Nov 2015 | 1447 |
| 05 Nov - 11 Nov 2015 | 707 |
| 12 Nov - 18 Nov 2015 | 307 |
| 19 Nov - 25 Nov 2015 | 142 |
| 26 Nov - 02 Des 2015 | 1557 |
| 03 Des - 09 Des 2015 | 390 |
| 10 Des - 16 Des 2015 | 889 |
| 17 Des - 23 Des 2015 | 653 |
| Jumlah Keseluruhan | 9821 |

Recapitulation of the data is then drawn into a graph to determine the ordering data patterns plain black T-shirt. Order to determine the ordering pattern is to find the method that will be used for the prediction to fit the pattern of the resulting data. Graph data is plain black T-shirt booking can be seen in Figure 4.




Figure 4 Graph Sales

Judging from the chart it can be concluded that the data Markowitz patterns fluctuate irregularly, then the forecasting methods used are single moving average.

The prediction was made on December 24 to December 30, 2015 by using equation (1), the following formula forecasting function Single Moving Average method.

$$Y_{t+1} = \frac{Yt + Yt-1 + \ldots + Yt-k+1}{k}$$

Where:

Yt + 1 = value forecasting for the next period

Yt = actual value / actual in period t

K = number of treatments in the moving average

Data recapitulation plain black T-shirt bookings from 01 October to 23 December are used to calculate the forecast date of December 24 to December 30, 2015.

1. An example of the prediction dated December 24 to December 30, 2015 using 10 the previous week.

$Y_{13}=(Y_3+Y_4+Y_5+Y_6+Y_7+Y_8+Y_9+Y_{10}+Y_{11}+Y_{12}) / 10$

$Y_{13}=(656+809+1447+707+307+142+1557+390+889+653) / 10$

$Y_{13} = 7557 / 10$

Calculation of single moving average for the full calculation results can be seen in Table 4.

Table 4 Results Product Forecasting Kaos Polos Color Black

| Minggu | Tanggal | Data Aktual | Moving Average (Minggu) |
|---|---|---|---|
| | | | 10 |
| 1 | 01 Okt - 07 Okt 2015 | 775 | - |
| 2 | 08 Okt - 14 Okt 2015 | 1489 | - |
| 3 | 15 Okt - 21 Okt 2015 | 656 | - |
| 4 | 22 Okt - 28 Okt 2015 | 809 | - |
| 5 | 29 Okt - 04 Nov 2015 | 1447 | - |
| 6 | 05 Nov - 11 Nov 2015 | 707 | - |
| 7 | 12 Nov - 18 Nov 2015 | 307 | - |
| 8 | 19 Nov - 25 Nov 2015 | 142 | - |
| 9 | 26 Nov - 02 Des 2015 | 1557 | - |
| 10 | 03 Des - 09 Des 2015 | 390 | - |
| 11 | 10 Des - 16 Des 2015 | 889 | 827.9 |
| 12 | 17 Des - 23 Des 2015 | 653 | 839.3 |
| Hasil Peramalan 24 Des - 30 Des 2015 | | | 775.7 |

The next stage after the counting results of forecasting is to calculate the error value by using Mean Square Error (MSE) using equation (2). This error value forecasting sought to select a value that will be used in the system to be built, following an MSE.

$$MSE = \frac{\Sigma(At - Ft)^2}{n}$$

Where:

At = Actual Demand in period t

Ft = Forecasting Demand in period t

n = number of forecast period involved

The calculation of the value of the error for more details can be seen in Table 5.

Table 5 Error Value Calculation Of Results Forecasting Using Data 10 Weeks.

| Periode | Data Aktual (At) | Forecast (Ft) | At- Ft | (At- Ft)$^2$ |
|---|---|---|---|---|
| 1 | 775 | - | - | - |
| 2 | 1489 | - | - | - |
| 3 | 656 | - | - | - |
| 4 | 809 | - | - | - |
| 5 | 1447 | - | - | - |
| 6 | 707 | - | - | - |
| 7 | 307 | - | - | - |
| 8 | 142 | - | - | - |
| 9 | 1557 | - | - | - |
| 10 | 390 | - | - | - |
| 11 | 889 | 827.9 | 61.1 | 3733.21 |
| 12 | 653 | 839.3 | 186.3 | 34707.69 |
| Jumlah (At-Ft)$^2$ | | | | 38440.9 |
| Nilai MSE | | | | 19220.45 |

Based on the results of forecasting products plain black shirt for week 13 dated December 24 to December 30, 2015 in Table 4, the chosen forecasting calculations using data from 10 the previous week amounted to 755.7, because it has the smallest error as compared with the calculation lainnyan at 19220.5. Selection of the smallest error value because the smallest error value capable of providing relatively consistent for all data inputs compared to models with large MSE. Based on the results of forecasting the CV. Kaoskosong advised to procure the product by the number rounded to 755.7 pcs 756 pcs of various sizes and shapes.

### 2.2.2 Inventory Monitoring Analysis Method of Safety Stock

CV. Kaoskosong in the previous steps do not implement safe systems for inventory stock. Implementation of security or safety stock inventory serves to protect the error in predicting demand during lead time. The formula used is the equation (2).

Sample case :

| | | |
|---|---|---|
| The average request dated 24 December to 30 December 2015 from forecasting results | (d) | $= 755.7/7$ $= 107.96 \approx 108\ pcs$ |
| Lead time | (l) | = 7 Hari |
| The standard deviation of lead time | (sl) | = 0.7 |
| Standard deviation request | (sd) | = 10.8 |
| Service Level 95% | (Z) | = 1.645 |

(A company's ability
to handle the request)

Settlement:

Safety Stock = Z x sdl

sdl = $\sqrt{d^2 \; x \; sl^2 + l \; x \; sd^2}$

sdl = $\sqrt{108^2 \; x \; 0.7^2 + 7 \; x \; 10.8^2}$

sdl = $\sqrt{6531.84}$

sdl = 80.82

Safety Stock = 1.645 x 80.82

Safety Stock = 132.95 (133 pcs)

Based on the safety stock calculations, the number is 133 pcs should provide a safe stock for raw materials by 133 pcs.

### 2.2.3 Distribution Analysis

Distribution is an activity within the supply chain. Distribution activities are carried out in CV. Kaoskosong is sending the products to the branch because pemesaan happen anyway branched products. According to the business rules product that is distributed is 5% of the products go to CV. Kaoskosong of t-shirt and shirt colors, all branches will get 35% and 65% for CV. Kaoskosong. Branch distribution schedule to do each product entered and when the product is entered more than 1000 pcs for all t-shirts, and the product is delivered at 09.00 after the starting time. Vehicles used car or motorcycle are available depending on the vehicle. If the car can accommodate about 1500 pcs 300 pcs and motors.
Sample case :
December 24, 2015 Date of entry into the warehouse products reached 3896 pcs (Some colors and types). From the amount of incoming products, about 35% of the incoming product will be distributed for 1364 pcs to all branches and for product details go to the central warehouse CV.Kaoskosong can be seen in Table 6. How to scheduling distribution CV. Kaoskosong.
Total Products Go to Warehouse Center = 3896

Table 6 Product Details Go to Warehouse Fitness CV.Kaoskosong

| Jenis/Warna | Jumlah |
|---|---|
| Polos/Hitam | 656 |
| Polos/Putih | 416 |
| Polos/Merah | 171 |
| Polos/Navy | 500 |
| Polos/Hijau | 350 |
| Polos/Biru Baby | 200 |
| Polos/Marun | 394 |
| Polos/Biru | 441 |
| Polos/Abu | 118 |
| Raglan/Marun Hitam | 200 |
| Raglan/Abu Hitam | 150 |
| *Rainbow*/Hitam | 300 |
| Jumlah Total Produk yang akan didistibusi | 1364 |

Here is the calculation of the amount to be distributed to the branch for a plain black T-shirt.
The number of products to every branch = number of products entered in black * 35%
= 656 * 35%
= 229.6 ≈ 230 pcs

Based on the examples of such cases, the amount of the distribution of products for CV. Kaoskosong and branches CV. Kaoskosong can be seen in Table 7.

Table 7 Distribution of Products for Distribution and Stock CV.Kaoskosong

| CV. Kaoskosong (65%) | Cabang CV. Kaoskosong (35%) |
|---|---|
| 426 | 230 |

Having in mind the amount to be is distributed, it will be known how much that will be obtained for each branch. The amounts distributed to all branches a number of 230 pcs. The number is the number to all branches, because CV. Kaoskosong has 7 branches then enter the product will be distributed to all branches. Following the calculation of the total number of products to be distributed.
Total distribution = 230 pcs
Total distribution to each branch
= Total distribution / 7
= 265 / 7
= 32,86 ≈ 33 pcs

Based on previous calculations, the amount of product black plain t-shirts to be distributed to each branch about 33 pcs for more details can be seen in Table 8.

Table 8 Number of Products That Will be distributed to each branch

| Jumlah Produk Untuk Distribusi | KKHQ (Kaos Kosong HQ) | Polos Ngideur | Polos bdg | Mamessa Cotton Combed | Polosbossku | KaDe (Kaos Hade) | Kaoskosong_plg |
|---|---|---|---|---|---|---|---|
| 230 | 33 | 33 | 33 | 33 | 33 | 33 | 33 |

Process distributor by dividing by the average number of distribution and the distribution process do not see the stock is branched would result in a buildup of stocks in one branch, then after calculating the amount of product that will be is

distributed CV. Kaoskosong will do monitorng products to every branch.

For example, suppose the company has a stock of data every branch on December 24, 2015. Stock in each branch can be seen in Table 9.

Table 9 Kaos Polos Stock Product Data Colour Black Branch

| No | Cabang CV. Kaoskosong | Jumlah Produk yang Tersedia | Safety Stock |
|---|---|---|---|
| 1 | KKHQ (Kaos Kosong HQ) | 598 pcs | 133 pcs |
| 2 | Polos Ngideur | 50 pcs | 133 pcs |
| 3 | Polosbdg | 800 pcs | 133 pcs |
| 4 | Mamessa Cotton Combed | 429 pcs | 133 pcs |
| 5 | Polosbossku | 100 pcs | 133 pcs |
| 6 | KaDe (Kaos Hade) | 840 pcs | 133 pcs |
| 7 | Kaoskosong_plg | 340 pcs | 133 pcs |

According to the table 9 then the CV. Kaoskosong can monitor the stock in the branch to be able to specify which branch will be distributed more products because of the stock in the branch and branch bit which will be distributed fewer products because of the stock in the branch are melipah amount. The following calculations determining the amount of the distribution :

The amount to be distributed to the branch = 230 pcs
Safety stock = 133 pcs
Stok Polos Ngideur = 50 pcs
Stok Polosbossku = 100 pcs
settlement :
The amount to be distributed to Polos Ngideur = Safety Stock – Branch Stock
= 133 – 50
= 83 pcs

So Solid ngideur will get 83 pcs plain black T-shirt.

The amount to be distributed to Polosbossku = Safety Stock – Branch Stock
= 133 –100
= 33 pcs

Then Polosbossku will get 33 pcs plain black T-shirt.

From the results of the calculation are the rest of the stock is distributed to a number of 114 pcs, then the remaining amount will be divided equally among each branch are experiencing a shortage of the number 57 pcs for more details can be seen in Table 10.

Table 10 Number of Product Monitoring results will be distributed to each branch

| Jumlah Produk Untuk Distribusi | KKHQ (Kaos Kosong HQ) | Polos Ngideur | Polos bdg | Mamessa Cotton Combed | Polosbossku | KaDe (Kaos Hade) | Kaoskosong_plg |
|---|---|---|---|---|---|---|---|
| 230 | 0 | 140 | 0 | 0 | 90 | 0 | 0 |

The previous calculation is applied anyway when all branches undergo a vacancy, if after the calculation there are branches that suffered kekirangan then head of the warehouse will be added on the product that has been stored in the central warehouse CV.Kaoskosong.

From table 10 it can be seen plain ngideur and polosbossku branch will receive the product from the center. It is based on the results of monitoring branch ngideur plain and polosbossku remaining stock had crossed the line of safety stock and therefore head of the warehouse set ngideur and polosbossku plain branch will receive the product's description can be seen in Table 11.

Table 11 Scheduling Distribution to branches

| Tanggal Distribusi | Jam Pengiriman | Nama Pengirim | Cabang | Lokasi | Kendaraan | Jumlah Produk Kaos Polos Hitam | Jumlah Keseluruhan Produk Kaos Polos Hitam |
|---|---|---|---|---|---|---|---|
| 24 Desember 2015 | 09.00 | Aris | Polos Ngideur | Jl. Jalaprang No. 87 | Motor (D3283WI) | 140 | 230 |
| | | | Polosbossku | Jl. Cilisung Rw 05 Desa Sukamenak Kec. Margahayu | | 90 | |

conclusion:

The number of products entered into the warehouse CV. Kaoskosong on November 1, 2015 reached approximately 3896 pcs 656 pcs and is the product of a plain black T-shirt. Of the total 656 pcs the most amount will be distributed to the branch, with the number of 230's and 426 branches throughout the central warehouse for the stock CV. Kaoskosong. After monitoring by the head of the branch turns polosngideur and polosbossku who get the product delivery of 140 pcs of plain black shirt for polosngideur and 90 pcs for polosbossku because the branch is exactly what deficiency and other branches there are still more stock.

After getting the amount to be is distributed then the CV. Kaoskosong will assign vehicles to send and delivery network mapping. If the amount is distributed is 230 pcs will then resume. Kaoskosong can use the motor to deliver the product to the delivery network mapping can be seen in Figure 5, and according to business rules most branches far is to be sent in advance.

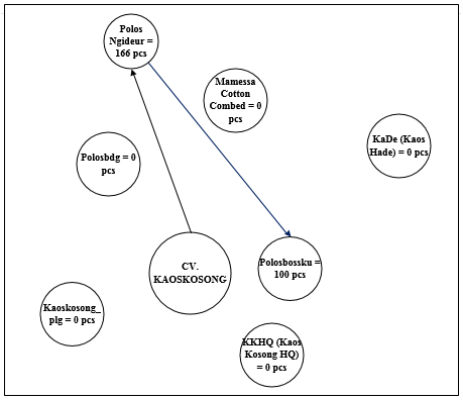



Figure 5: Map Network Delivery

From Figure 5, the action to be taken is to build a system by inserting a delivery menu in order for the CV. Kaoskosong find out information about the delivery date, the number of products shipped, who is sending and what vehicles are used to send.

### 2.3 Database Analysis

Entity-Relationship is a technique to describe the information required in the system, and the

relationship between these data, used to describe some notations and symbols. Figure 6 describes the Entity Relationship Diagram (ERD).

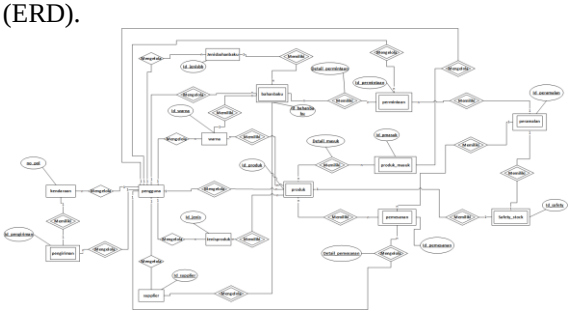


Figure 6 Entity Relationship Diagram (ERD)

### 2.4 Diagram Konteks

Data Flow Diagram is used to describe in more detail the system that exist in the context diagram into multiple processes tenjadi between the entities involved in this information system. Figure 7 describes the system context diagram of information that is being built.

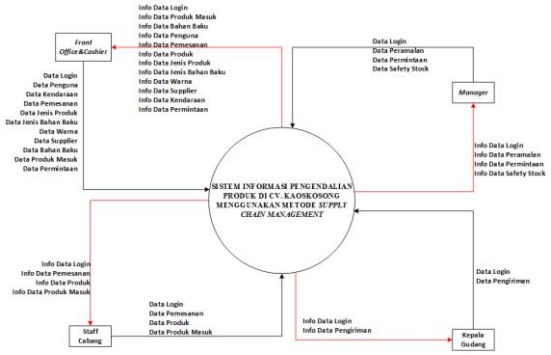



Figure 7 Diagram Konteks

## 3. IMPLEMENTATION AND TESTING

### 3.1 System Implementation

The hardware specifications used in the development of information systems control product in CV. Supply Chain Kaoskosong methods listed in Table 12.

Table 12 Hardware Used

| No | Perangkat Keras | Spesifikasi |
|---|---|---|
| 1 | Processor | Kecepatan 1.6 Ghz |
| 2 | Monitor | Monitor 14" Resolusi 1024 x 768 |
| 3 | Memori | RAM DDR3 3 GB |
| 4 | Hardisk | 500 GB |
| 5 | VGA Card | 1 GB |
| 6 | Perangkat keras pendukung | Printer, Mouse, Keyboard, dan Wi-fi |

The hardware specifications used in the development of information systems control product in CV. Supply Chain Kaoskosong methods listed in Table 13.

Table 13 Software Used

| No | Perangkat Lunak | Keterangan |
|---|---|---|
| 1 | Sistem Operasi | 64 bit Operating Sistem Service Pack 3 |
| 2 | Web Browser | Google Chrome |
| 3 | Bahasa Pemograman | PHP |
| 4 | DBMS | MySQL |
| 5 | Code Editor | Sublime Text |
| 6 | DFD Modeler | Microsoft Visio 2016 |
| 7 | Web Server | XAMPP 3.211 |

### 3.2 Implementatation Interface

Implementation of the interface is done by each display program that has been built and encoding in the form of program files. Implementation of interface is created and differentiated between the interface for warehouse manager and head.

#### 3.2.1 Implementatation Interface Manager

Implementation of interface found on software intended for managers can be seen in Figure 8.

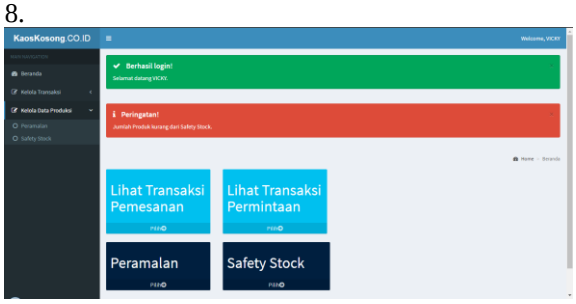



Figure 8 Menu Manager

#### 3.2.2 Implementation Interface Head Of Warehouse

Implementation of interface found on software intended for the head of the warehouse can be seen in Figure 9.

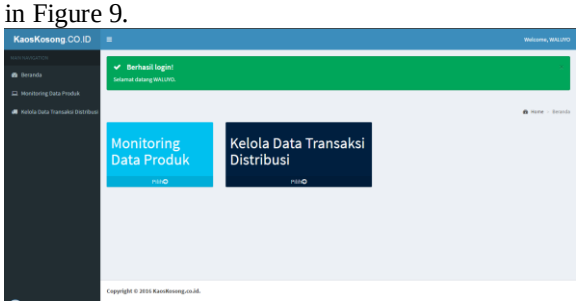



Figure 9 Menu Head Of Warehouse

### 3.3 System Testing

Testing the system aims to find errors and deficiencies in the system under test. The test is intended to determine the system that has been made already meet the requirements in accordance with the purpose of making this system. Testing the system uses black box testing and testing interview.

#### 3.3.1 Scenario Testing Black Box Home Manager

An explanation of the scenario manager page black box testing can be seen in Table 14.

Table 14 Scenario Testing Black Box Manager

| Kelas Uji | Butir Uji | Jenis Pengujian |
|---|---|---|
| Login *manager* | Mengisi data login | *Black Box* |
| | Verifikasi data login | |
| Data Peramalan | Menambah data peramalan | *Black Box* |
| | Menghapus data peramalan | |
| Data *Safety Stock* | Menambah data *safety stock* | *Black Box* |
| | Menghapus data *safety stock* | |
| Logout | Menghapus session *front office (cashier)* | *Black Box* |

### 3.3.2 1 Scenario Testing Black Box Home Head Of Warehouse

An explanation of black box testing scenarios yard head of the warehouse can be seen in table 15

Table 15 Scenario Testing Black Box Head Warehouse

| Kelas Uji | Butir Uji | Jenis Pengujian |
|---|---|---|
| Login Kepala Gudang | Mengisi data login | *Black Box* |
| | Verifikasi data login | |
| Data Pengiriman | Menambah data pengiriman | *Black Box* |
| | Mengedit data pengiriman | |
| | Menghapus data pengiriman | |
| Logout | Menghapus session *front office (cashier)* | *Black Box* |

### 3.4 Testing Interview

Interviews were conducted to test for the yard manager, head of the warehouse yard, on a CV. Kaos left blank. Interview on page manager, head of the warehouse on the CV page. Kaoskosong.

### 3.4.1 Testing Interview For Mananger

Testing interviews with system control product information in the CV. Kaoskosong using the method of supply chain management at CV. Kaoskosong to the manager, Mr Vicky Lutfi. The activities of this interview conducted on July 28, 2015 which is housed in CV.Kaoskosong. Testing interview for manager can be seen in Table 16.

Table 16 Results of Interviews Page Manager

| | |
|---|---|
| 1. Apakah sistem informasi ini membantu meningkatkan fleksibilitas kerja ? | |
| Jawaban narasumber | Menurut *manager*. sistem infomasi ini membantu meningkatkan fleksibilitas kerja. |
| 2. Apakah sistem informasi ini mudah dipahami dan dipelajari? | |
| Jawaban narasumber | Menurut *manager* sistem iniformasi ini mudah dipahami. |
| 3. Apakah sistem informasi ini mudah dioperasikan? | |
| Jawaban narasumber | Menurut *manager*, sistem informasi ini mudah untuk dioprasikan. |
| 4. Apakah anda mudah berinteraksi dengan sistem ini saat menggunakannya? | |
| Jawaban narasumber | Menurut *manager*, sistem informasi ini mudah untuk berinteraksi dengan *manager*. |
| 5. Apakah dengan adanya sistem ini, dapat memudahkan Anda dalam proses kerja anda? | |
| Jawaban narasumber | Menurut *manager*, sistem informasi ini sangat memudahkan kerja *manager* |
| 6. Apakah dengan adanya sistem ini, dapat memudahkan Anda dalam memonitoring transaksi pemesanan konsumen? | |
| Jawaban narasumber | Menurut *manager*, sistem informasi ini memudahkan dalam memonitoring pemesanan konsumen. |
| 7. Apakah dengan adanya sistem ini, dapat memudahkan Anda dalam memonitoring kebutuhan bahan baku untuk dipesan ke *supplier*? | |
| Jawaban narasumber | Menurut *manager*, sistem informasi ini sangat memudahkan untuk memonitoring data bahan baku yang tersedia dan yg akan dipesan ke *supplier*. |
| 8. Apakah dengan adanya sistem ini, dapat memudahkan Anda dalam menentukan jumlah produksi? | |
| Jawaban narasumber | Menurut *manager*, sistem informasi ini memudahkan dalam penentuan jumlah produksi untuk periode selanjutnya |
| 9. Apa saran Anda untuk sistem yang dibangun ini, agar menjadi lebih baik kedepannya? | |
| Jawaban narasumber | Menurut *manager*, saran untuk sistem informasi ini adalah perlu perbaikan dari segi penampilan dan terintegrasi ke *supplier*. |

### 3.4.2 Testing Interview For Head Of WareHouse

Testing interviews with system control product information in the CV. Kaoskosong using the method of supply chain management at CV. Kaoskosong to the manager, Mr Waluyo. The activities of this interview conducted on July 28, 2015 which is housed in the CV. Kooskosong. Testing interview for the head of the warehouse can be seen in Table 17.

Table 17 Results of Interviews Page cellarer

| | |
|---|---|
| 1. Apakah sistem informasi ini membantu meningkatkan fleksibilitas kerja ? | |
| Jawaban narasumber | Menurut kepala gudang, sistem infomasi ini membantu meningkatkan fleksibilitas kerja. |
| 2. Apakah sistem informasi ini mudah dipahami dan dipelajari? | |
| Jawaban narasumber | Menurut kepala gudang sistem iniformasi ini mudah dipahami. |
| 3. Apakah sistem informasi ini mudah dioperasikan? | |
| Jawaban narasumber | Menurut kepala gudang, sistem informasi ini sangat mudah untuk dioprasikan. |
| 4. Apakah anda mudah berinteraksi dengan sistem ini saat menggunakannya? | |
| Jawaban narasumber | Menurut kepala gudang, sistem informasi ini mudah untuk berinteraksi dengan kepala gudang,. |
| 5. Apakah dengan adanya sistem informasi ini dapat memudahkan Anda dalam proses memonitoring stok dicabang? | |
| Jawaban narasumber | Menurut kepala gudang, sistem informasi ini sangat memudahkan karena pada sebelumnya tidak ada monitoring di cabang hal tersebut dapat menyebabkan penumpukan stok di gudang. |
| 6. Apakah dengan adanya sistem informasi ini dapat memudahkan Anda dalam melakukan proses pendistribusian produk? | |
| Jawaban narasumber | Menurut kepala gudang, sistem informasi ini memudahkan dalam pendistribusian produk. |
| 7. Apakah dengan adanya sistem informasi ini dapat memudahkan Anda dalam melakukan proses penentuan kendaraan dalam mendistribusikan produk? | |
| Jawaban narasumber | Menurut kepala gudang, sistem informasi ini sangat memudahkan untuk menentukan kendaraan untuk pendistribusian. |
| 8. Apa saran Anda untuk sistem yang dibangun ini, agar menjadi lebih baik kedepannya? | |
| Jawaban narasumber | Menurut kepala gudang, saran untuk sistem informasi ini adalah ditambahkan detail penditribusian, seperti produk apa yang akan dikirim. |

### 3.4. Conclusion Testing Results Interview

Based on interviews each user or resource to a question asked in the test interviews can be concluded that the system is already user friendly, easy to use, helping managers in determining the amount to be produced and the raw materials to be ordered, helping the head of the warehouse to determine the amount of product which will be distributed by way of monitoring the stock of products in each branch and scheduling of distribution includes the distribution date, sender's name, the amount of the distribution, and the vehicle will be used, as well as help the front office (cashier) dab branch staff in operational activities.

## 4. CONCLUSIONS AND RECOMMENDATIONS

### 4.1 Conclusions

After doing the analysis, design, and testing methods and beta black box, it can be concluded as follows:

1. This system which has been built to facilitate the manager to determine the amount of raw materials to be ordered.
2. The system has been built to facilitate this manager to determine the amount of product to be manufactured.
3. The system has been built to facilitate this head of the warehouse to determine the number of products to be distributed.
4. The system has been built to facilitate this head of the warehouse to make scheduling product distribution was to branch.

**4.2 Recommendations**

The results that have been done until the final stages, there are some drawbacks. Suggestions for adding things that can complement the transport field control system is to come. Among others are :

1. System software product controls information in the CV. Supply Chain Kaoskosong method can still be improved zoom so that more users can simplify this system.
2. Forecasting methods used disistem can be added back to mengantisipasti different data characteristics.
3. The system control product information in the CV. Kaoskosong using Supply Chain can be redeveloped so that suppliers and consumers can be fully integrated with the CV. Kaoskosong.
4. This information system in the distribution process are the product details will be distributed.

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