DEVELOPMENT OF CHAIN MANAGEMENT SUPPLY INFORMATION SYSTEM IN CV NUGARADA ABADI

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ABSTRACT

CV. Nugarada Abadi is a company engaged in the procurement of goods in government agencies, including the work of procurement of office stationery, practicum tools, chemicals and electronic materials which are housed in puricipageran, cimahi. The company purchases goods after obtaining order requests from consumers or by using the make to order strategy. in the procurement process there is often a buildup if the goods are purchased too much, causing accumulation of goods so that the company must rent a place and the return of goods in the process of distribution to consumers. Based on the above problems to overcome these problems is by building an Information System at CV Nugarada Abadi Using a Supply Chain Management Approach with the aim of facilitating the company in determining how many periods the company makes an order to the supplier, because the supplier has restrictions on receiving goods orders. The method used to determine the time of procurement using the economic order quality method. Based on the test results, it can be concluded that this system has helped the procurement department in determining the time of procurement of suppliers so that it is not hampered by the process of shipping goods to consumers.

Keywords : *Supply Chain Management, economic order quality, make to order, information Systems, procurement.*

1. PRELIMINARY

CV. Nugarada Abadi is a company engaged in the procurement of goods in Government Agencies, including the procurement of office stationery, practicum tools, chemicals, electronic materials, machine tools. This company has supply chain activities, namely the upstream part of the CV. Nugarada Abadi carries out the process of procuring and receiving goods by using the make to order strategy, which is procured when there is a request from a customer consisting of a university or educational institution, a health institution and a company, while the downstream process is carried out using the company CV. Nugarada Abadi or with shipping services.

Based on an interview with the Director that procurement of goods was carried out at the time of CV. Nugarada Abadi gets a list of requests for goods from consumers in the form of BOQ (Bill Of Quantity). The process of ordering goods is carried out on one supplier of each type of goods, he said the delivery of goods from supplier to company is carried out in accordance with the amount ordered before, but in the process of ordering goods at the supplier has a limit on the amount of goods ordered, resulting in a delay in shipping. Usually the items ordered are up to three days but when the goods ordered are up to seven days late. This is a problem in the process of ordering goods on suppilier which has an impact on the process of distributing goods to consumers. Based on the interview with the shipping department that the purchase item arrived at the shipping department. The shipping department checks and packs the items to be distributed. The time of delivery of goods to consumers is in accordance with the time set by the procurement and shipping department. But in the process of shipping goods to consumers there is an obstacle if the items to be shipped are not available or there is a delay in the order process. This can cause the time to fulfill the goods to consumers to be late. Seeing the conditions that occur, then in supporting the activities that exist within the company needed a management concept that can regulate the flow of goods and the right information, namely the SCM concept[2]. Based on the consideration of several problems that have been described, the Supply Chain Management Approach Information System will be built on the CV. Nugarada Abadi. The aim to be achieved from this research is to assist the procurement department in purchasing goods at suppliers to meet the needs of consumer demand and provide suggestions in determining the delivery time of goods to consumers.

2. RESEARCH CONTENT

2.1 Information System

The system is a network of procedures that are interconnected, gathered together to carry out an activity or to complete a specific goal while 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 data. Data is

the plural of a single form of datum or item data. Data is a reality that describes real events and unity. [11] Information System is a series of activities to collect, process, store, analyze, and disseminate information to users for specific purposes.

2.2 Supply Chain Management

Supply Chain Management (SCM) emerged in the 1980s as a new, integrative philosophy for managing the total flow of goods from suppliers to end users and developing considering the integration of broad business processes along the supply chain. Keith Oliver coined the term "supply chain management" in 1982, developing an integrated inventory management process for the trade balance between his clients' inventory of desired and customer service objectives. The original focus is the management of the supply chain as if it were a single entity, not a different function group, "with the main objective of improving suboptimal distribution of inventory and capacity caused by conflicts between functional groups within the company. Supply chain management (supply-chain management) is the integration of materials and services procurement activities, conversion into semi-finished goods and end products, as well as shipping to customers.The aim is to build a supplier chain that focuses on maximizing value for customers.The key to effective supply chain management is to make suppliers as "partners" in the company's strategy to meet the ever-changing market. [7] The supply chain management process is the process of processing products from raw materials, semi-finished products to finished products and then sold through various facilities ai throughout the product and material flow. When described in the form of a chart it will appear as follows:

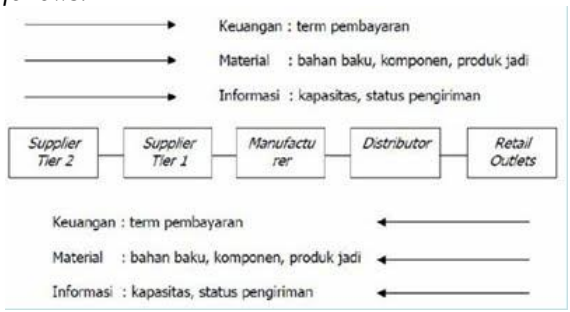

***Image 1** Supply Chain Process and 3 types of managed flows*

Image 1 shows that supply chain management is the coordination of material, information and financial flows among participating companies.

2.3 Pull Supply Chain

Pull supply chain is a "make-to-order" production strategy whose main benefit is to avoid waste inventory or is a company strategy, especially a manufacturing company where new purchases are made always after market demand and are actually carried out at the customer's request. [7] In make to order the problem starts from downstream or the consumer ends up in the upstream or supplier. Usually the problem is the problem in the length of delivery lead time.

2.4 Inventory of the double priod

there are two types of the first period inventory system, the fixed order quantity model, also called the economic order quantity (EOQ) and the fixed time period model called jiga as a periodic system of periodic review systems. A dual period inventory system is designed to ensure that a product will always be available throughout the year. The difference between the two types is that the order quantity model is still influenced by the state of inventory while the model of the fixed time period is influenced by time. This means that the model of fixed order quantity is reorder order. this situation can occur at any time, depending on the demand for a particular type of product. Instead the model remains limited to ordering at the end of a predetermined time period. the time period that determines this model. [2]

2.5 Economic Order Quality (EOQ)

To use the fixed order quantity model (orders made when existing inventory reaches a certain point must be ordered) the remaining inventory must be continuously monitored so that the order quantity model remains a perpetual system, which must be updated every time a inventory is taken and added to find out whether the quantity of inventory has reached the point of re-ordering or not. Here's a structural picture Economic Order Quality (EOQ).

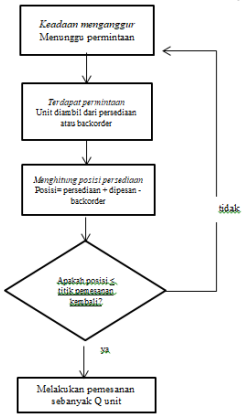

***Image 2.** Plot Economic Order Quality*

For the basic model, the calculation is considered: [2]

$$Qatau\ EOQ = \sqrt{\frac{2DS}{H}}$$

$$EOP = \frac{D}{Q}$$

Dimana :
Q : Jumlah bahan yang dipesan
D : Permintaan per tahun
EOP : Jumlah periode pemesanan

S = biaya pengaturan /biaya pemesanan(ongkos)
H = biaya pemympaan perunit rata rata persediaan

After the amount of each order is obtained we can calculate the time lag between orders (t) by dividing the number of days in the number of orders: [16]

$$t = \frac{Jumlah\ hari}{EOP}$$

2.6 Business rules

Analysis of business rules is explained about the regulatory provisions contained in the CV. Nugarada Abadi. Analysis of business rules will be divided into two analyzes, namely the analysis of current business rules and the analysis of business rules that will be proposed. Analysis of business rules CV. Nugarada Abadi as follows
:

A. Bussiness rule procurement

Table 1. *Bussiness rule procurement*

Aturan bisnis yang sedang berjalan	**Aturan bisnis yang diusulkan**
Pengadaan barang ke supplier dilakukan maximal tiga kali dalam seminggu.	Melakukan perhitungan dengan menggunakan metode EOQ untuk menentukan priode pengadaan pada supplier.

B. Bussiness rule delivery

Table 2. *Aturan bisnis pengiriman*

Aturan bisnis yang sedang berjalan	**Aturan bisnis yang diusulkan**
Waktu pendistribusian ditentukan pada awal penerimaan permintaan.	Melakukan pengiriman barang pada konsumen satu hari sesudah barang dari supplier sampai.

2.7 Model Supply Chain Management in CV. Nugarada Abadi

supply chain framework contained in CV. Nugarada Abadi is seen in Figure 3.

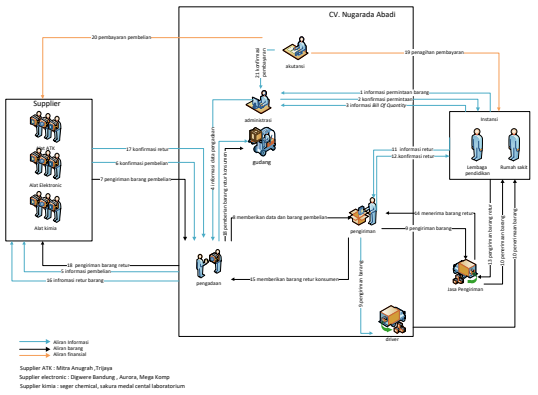

Image 3. *Model Supply Chain Management in CV. Nugarada Abadi*

2.8 Stages of analysis Supply Chain Management in CV. Nugarada Abadi

Supply Chain Analysis to describe the system that will be built on CV. Immortality is based on the Supply chain analysis model in image 3. As for supply chain analysis can be seen in image 4: [15]

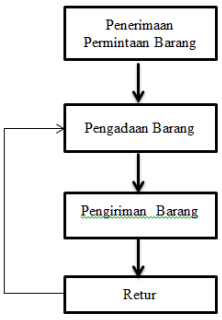

Image 4. *analysis Supply Chain Management*

2.9 Analysis receipt of requests

supply chain stage at CV. Nugarada Abadi, which was involved in the stages of procurement procurement from consumers, was CV Nugarada Abadi and consumers. At this stage CV Nugarada Abadi is a company that receives requests from consumers to carry out the procurement process. This company manages the ordering data of goods ordered by consumers for the types of goods that can be distributed directly. If the CV. Nugarada Abadi accepts consumer requests, CV. Nugarada made an agreement with consumers in determining the time for the procurement of goods given in the form of a product request data list (Bill of Quantity).

2.10 Analysis Procurement

supply chain stage at CV. Nugarada Abadi, which was involved in the procurement stage, was CV. Nugarada Abadi and the supplier. In this stage, the EOQ method is used as a reference for the procurement process. Sampled from the request for procurement of PT. Cakramas Sumber Makmur with the name of the item 70 grams HVS with specifications 70 grams and type paper with the number 70 rim. At this stage, the ordering of goods is scheduled for suppliers. Before scheduling using

the EOQ method, it is necessary to analyze the supplier, namely the supplier appointed by the procurement department to confirm and fill the price of the goods ordered. In the process of purchasing rice items designated as suppliers by the name of PT Jaya Abadi, then the calculation is done using the Economic Order Quantity (EOQ) method. By using the EOQ method which aims to find out the schedule of procurement of goods carried out on suppliers and the amount of goods for each order. The following are the results of calculations using the EOQ method.

Table 3. *procurement schedule HVS 70 gram on Trijaya*

Tanggal	Qty	Total Harga(Rp)
18/8/2017	17 rim	336,000
24/8/2017	17 rim	336,000
30/9/2017	17 rim	336,000
5/9/2017	17 rim	336,000
11/9/2017	2 rim	96,000

Based on the results above the time lag for each order was 6 days. So that the order of goods with the name of 70 grams HVS makes an order for the work five times the order within a period of six days with a maximum order of 17 rim for each order.

2.11Analysis delivery

the supply chain stage at CV. Nugarada Abadi, which was involved in the shipment stage, was CV. Nugarada Abadi, which is the shipping department and drivers with agencies. The distribution steps are as follows:

1) *Determine the location of the shipment of goods.*
2) *Calculate the amount of cargo by calculating the number of items to be sent.*

There is a shipping activity in the supply chain. Activities in shipping are determining the delivery time and type of shipment used in the delivery of goods. Determine the time of delivery of goods so that the goods are on time. The delivery schedule is made one day from the arrival of the goods from the supplier due to checking and checking. For the process of packing the goods to be sent into the box with a size of 100cm x60cm x 45cm, then the shipment of goods is carried out in three types, namely the delivery using company vehicles, leasing transport services and using shipping services.

In the distribution of CV. Nugarada Abadi has provisions that if the relevant agency is in the Bandung and Cimahi areas, the shipment is carried out by using the company's vehicle. For the capacity of the vehicle can be seen in the following table.

Table 4. transportation type

Plat Nomor	Nama Kendaraan	Jenis kendaraan	Tahun	Kapasitas/ dus
D 5930 AEV	Mitsubishi pickup	Mobil box	2011	±35 dus
D 9454 EHZ	Suzuki pickup	Mobil box	2009	±35 dus
D 3942 HV	Honda Vario	Motor	2013	2 dus

On each shipment CV Nugarada made one-way delivery in one day. If the distribution is still done in Bandung and Cimahi, then the company vehicles are not available, then the CV. Nugarada Abadi makes deliveries by renting vehicles or transport services. If the distribution is carried out outside the areas of Bandung and Cimahi, the shipping is carried out using shipping services such as Logistic Guides.

2.12Retur

the supply chain stage at CV. Nugarada Abadi, which is involved in the goods return stage, is the relationship between CV. Nugarada Abadi with consumers and suppliers. This stage aims to purchase goods again in the event of an error or damage to the goods to maintain the good name of the company and the relationship between CV. Nugarada Abadi with consumers and suppliers. At this stage, items that have been ordered or shipped may have damaged items or specifications that are not in accordance with the request. Customer returns is where the delivery process carried out by CV. Nugarada Abadi to consumers will show that there is an item that is damaged or not in accordance with the specifications. In the return process that can be done is to provide goods returned from consumers to the company to enter the warehouse. Following are examples of items that will be returned to CV requests. Cakramas Sumber Makmur.

Table 5. Retur consumers

No	Alasan	Yang diminta	Satuan	jumlah	Tanggal
41	Salah spesifikasi	Botol Timbang	Buah	1	2-Sep-2017

Supplier return is where the shipping process carried out by the company to the supplier will be therapeutic, there is an item that is damaged or not in accordance with the specifications and returned goods carried out by the consumer due to an error or damaged item. In the return process that can be done is by exchanging it again by replacing items or can

be replaced in the form of financial money. However, the process can be carried out with the agreement of both parties, namely CV. Nuagarada and the supplier. The return process to the supplier is carried out by procuring by contacting the supplier who is in contact. If the supplier receives a return request, the procurement department immediately sends the returned goods to the supplier. The following is an example of the item received by the Trijaya supplier for a return request.

Tabel 6. Retur Supplier

Tanggal	Nama barang	satuan	jumlah	alasan
12/9/2017	Cat besi/kayu	Kaleng	1	Kemasan rusak

If the supplier does not accept the return process, the procurement department provides data on return and goods returns to the warehouse to be sent to the warehouse.

2.13Analysis database

Database analysis is the activity of analyzing data that will be processed and stored in a database. From the results of the analysis at CV Nugarada Abadi there is data that will be used in the system development process. From the data obtained will be used to design the database with complete attributes. In this case Entity Relationship Diagram (ERD) will be used to design the database. ERD which is the analysis hash as follows:

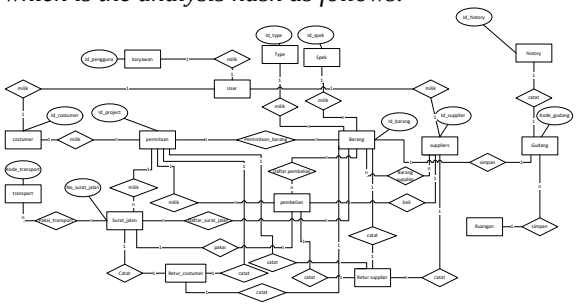

***Image 5.** ERD information system Supply Chain Management in CV. Nugarada Abadi*

2.14context diagram

Context diagram is the highest diagram of the data flow, which describes all input or output from the system that is built. The following is a context diagram of the supply chain management information system on the CV. Nugarada Abadi:

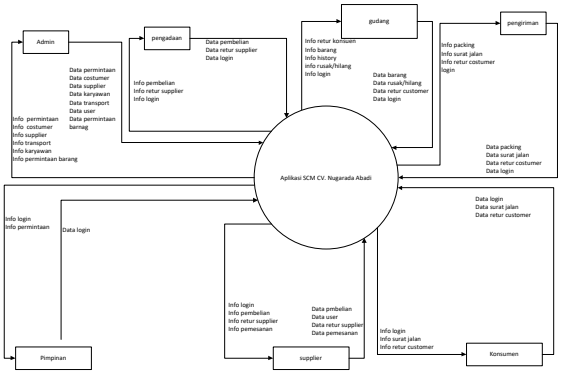

***Image 6.** Diagram Konteks*

3. FINISHER

3.1Conclusion

The conclusion that can be drawn from all the processes that have been carried out in building this information system are as follows:

1. *This supply chain management information system can assist the procurement department in dividing the procurement process to suppliers into several periods.*
2. *This supply chain management information system gives suggestions to the shipping department in determining the delivery schedule for consumers.*

3.2Suggestion

Information system built with supply chain management approach at CV. Nugarada Abadi can still be further developed with higher system specifications and better performance. The following are some suggestions that can be used for the development of this research:

1. *The backend interface display in future research is expected to be more interesting for system users.*
2. *In the case of data import boq can use various formats.*

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