

A Conceptual of Supply Chain Management Distribution System to Minimize Leadtime and Distribution Fees in Retail Industry

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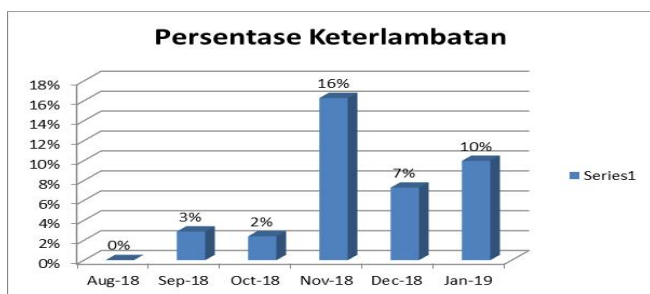
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Abstract - PT ABCD is a company engaged in retail in the form of shoe products. The study was conducted in August 2018 until January 2019 in the Logistics and distribution division. The problem that predominates in this division is the problem of delays in the distribution of goods because the distribution process is still done conventionally with improvised methods and human resources. In August 2018 the amount of costs incurred was Rp.1,766,725,193 and experienced an average increase of 4% every month. From the observational data, the leadtime achieved was still below the company's target of 80%, the average delay percentage was 6% or 4926 koli from 74660 koli. With the Supply Chain Management distribution method, including the Crossdocking, Direct Shipment and Warehousing methods. By comparing the three methods the lowest leadtime is generated and simulating it, the right method for the company is obtained, namely the cross docking distribution method with the results of the fastest lead time calculation, which is 240 minutes faster than the other methods. And from the simulation a result also produced the same method with the achievement of 149.48 minutes lead time and has the smallest percentage of error values that is 38%.

Keywords: Supply Chain Management, Crossdocking, Direct Shipment, Warehousing.

I. INTRODUCTION

PT ABCD is a company engaged in retail or sales in the form of shoes in which the goods are sold at consignment department stores and outlets throughout Indonesia. The distribution system used by companies today still uses conventional distribution systems, conventional distribution



In Figure 1.1 Graph from August 2018 to January 2019, the leadtime achieved was still much below the company's achievement target of 80%, an average delay of 6%. In addition to the above problems, the costs incurred by the

company in August 2018 until January 2019 experienced a significant increase with an average increase of 4% each month. The increase in costs above was caused by the late distribution above. Thus the impact on companies that result in the amount of finalty received by the company, therefore it is necessary to improve the distribution channel by using the distribution method to maximize every process that occurs in the processes involved in the distribution of goods so that goods can be sent properly and does not cause losses to company.

In this study, the concept used is the concept of Supply Chain Management distribution consisting of Cross docking, direct Shipment and Warehousing. By comparing the variables or components that are in the three methods and comparing the cost calculation, it is expected to find the right method to be proposed to the company.

II. REVIEW OF THE LIBRARY

1. Supply Chain Management

Supply Chain is a network of companies that jointly work to create and deliver a product to the end user [1] [2] [3]. The supply chain is essentially a network of organizations that deal with upstream and downstream relationships, in different processes and activities and produce value in the form of goods and services in the hands of end customers [2].

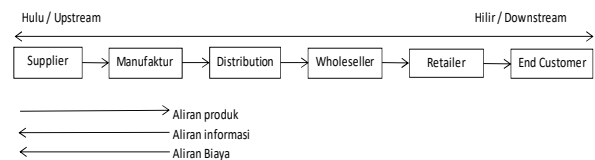


Figure 2.1 illustrates the structure of the supply chain

2. Supply Chain Management Strategy

Cross docking is a good method for reducing inventory while increasing customer satisfaction [4] [5]. Cross docking is identified as a consolidation of shipments of products that come in such a way that they can easily be sorted for delivery to their destination. The processes that occur in this method include:

1. Unloading Process
2. Screening Process

3. Reloading / loading process

Direct Shipment is a point-to-point service strategy so that factories send goods directly to retail, usually those using Direct Shipping are used for types of perishable goods, goods with large volumes and special products [7]. In this strategy, products are sent directly from suppliers to retail without going through a distribution center [8]. With this strategy, large numbers of vehicles are needed. There is no inventory storage in the warehouse, because the warehouse or distribution center does not exist.

Warehousing can be defined as a logistical part that regulates the problem of storing products in production, consumption and between production and consumption [1] [9]. Warehousing activities also provide management information about the status, condition and disposition of stored product items. In its implementation, warehouse is a more general term compared to distribution center. Warehouse or warehousing functions to store goods for production or results in a certain amount and time span which is then distributed to the destination location on request. The processes that occur in this method include [7]:

1. Receiving and putway
2. Dispatching
3. Stocktake
4. Reporting

Simulation according to [10] is the process of designing mathematical or logical models of real systems, conducting experiments on models using computers to describe, explain and predict system behavior. ProModel is a simulation technology for discrete events that is used to plan, design, and develop manufacturing processes, logistics, and other operations, both new and existing.

III. RESEARCH METHODS

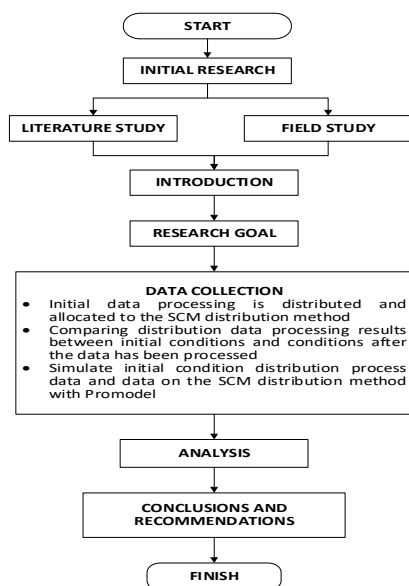


Figure 2 Flowchart Research Methods

IV. RESULTS AND DISCUSSION

The percentage in August is almost no delay, in September there was a delay of 3%, in October there was a delay of 2%, in November there was a delay of 16%, in December 7% and in January of 10%, the average delay of 6% or about 4826 kale out of a total of 74660 kale in that time span.

1. Leadtime and costs on crossdocking

Leadtime of all processes that occur in the cross docking method is 240 minutes or 6 hours. The comparative percentage of the company's existing methods in August 2018 amounted to Rp430,169,193 or 24% lower, in September 2018 amounted to Rp535,189,678 or 29% lower, in October 2018 amounted to Rp740,658,947 or 36% more low, in November 2018 of Rp.863,153,859 or 39% lower, in December 2018 of Rp785,827,624 or 37% lower and in January 2019 of Rp847,604,000 or 38% lower.

No	Proses	Nama Proses	Rincian Proses	Waktu Proses (menit)	Total Waktu Proses (menit)
1	Proses Unloading	Proses unloading barang dari Supplier/UKM	1. Bongkar barang dari supplier 2. Penyusunan barang per artikel	20 40	60
2	Proses Screening	Proses pemilahan barang sesuai wilayah	1. Proses penempelan barcode 2. Proses pemilahan per area	25 35	
3	Proses Sorting	Proses pemisahan perpalet dan per area	1. Proses pemisahan perpalet dan per area oleh forklip	60	60
4	Proses Reload/ Loading	Proses barang dimuat ke mobil Angkutan/ekspedisi	1. Proses barang dimuat ke mobil Angkutan/ekspedisi	60	60
TOTAL					240

No	Bulan	Biaya Kondisi awal	Biaya pada crossdocking	Persentase perbandinga
1	Agustus	Rp1.766.725.193	Rp430.169.193	24%
2	September	Rp1.872.855.678	Rp535.189.678	29%
3	Oktober	Rp2.080.784.947	Rp740.658.947	36%
4	November	Rp2.236.781.859	Rp863.153.859	39%
5	Desember	Rp2.147.879.624	Rp785.827.624	37%
6	Januari	Rp2.208.379.000	Rp847.604.000	38%
PERSENTASE RATA-RATA				34%

2. Leadtime on and direct shipment costs

The leadtime of the whole process that occurs in the direct shipment method is 420 minutes or 7 hours.

The percentage of comparison with the existing methods of the company that is in August amounted to Rp6,711,000,000 or 64% higher than the initial cost, in September 2018 amounting to Rp8,863,920,000 or 73% higher, in October 2018 amounting to Rp11,079,240,000 or 77% higher, in November 2018 amounting to Rp15,447,480,000 or 83% higher, in December 2018 amounting to Rp13,263,360,000 or 81% higher and in January 2019 amounting to Rp15,447,480,000 or 83% higher.

No	Proses	Nama Proses	Rincian Proses	Waktu Proses (menit)	Total Waktu Proses (menit)
1	Proses Pemeriksaan	Proses pemeriksaan barang yang selesai di produksi oleh karyawan pusat	1. Proses pemeriksaan barang setelah di produksi	60	180
			2. Proses pemeriksaan barcode dan artikel	60	
			3. Proses pemeriksaan segel	60	
2	Proses Sorting	Proses pemilahan barang sesuai wilayah	1. Proses penempelan barcode 2. Proses pemilahan per area	60 60	120
3	Proses Reklad/ Loading	Proses barang dimuat ke mobil Angkutan/ekspedisi	1. Proses barang dimuat ke mobil Angkutan/ekspedisi	120	120
TOTAL					420

No	Bulan	Biaya Kondisi awal	Biaya pada Direct Shipment	Persentase perbandingan
1	Agustus	Rp1.766.725.193	Rp6.711.000.000	64%
2	September	Rp1.872.855.678	Rp8.863.920.000	73%
3	Oktober	Rp2.080.784.947	Rp11.079.240.000	77%
4	November	Rp2.236.781.859	Rp15.447.480.000	83%
5	Desember	Rp2.147.879.624	Rp13.263.360.000	81%
6	Januari	Rp2.208.379.000	Rp15.447.480.000	83%
PERSENTASE RATA-RATA				77%

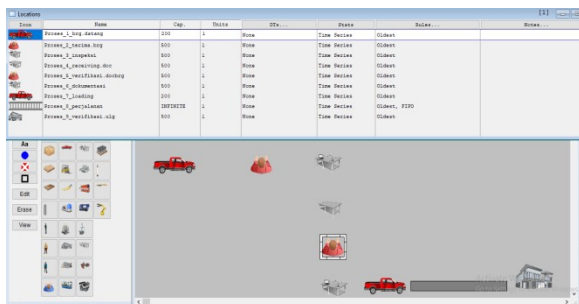
3. *Lead Time on Warehousing*

The leadtime of the whole process that occurs in the Warehousing method is 420 minutes or 7 hours. the percentage of comparison with the company's existing methods at this time in August amounted to Rp1,846,725,193 or 4% higher, in September 2018 amounting to Rp1,952,855,678 or 4% higher, in October 2018 amounting to Rp2. 160,784,947 or 4% higher, in November 2018 amounting to Rp2,316,781,859 or 3% higher, in December 2018 amounting to Rp2,227,879,624 or 4% higher and in January 2019 amounting to Rp2 .888,379,000 or 3% higher.

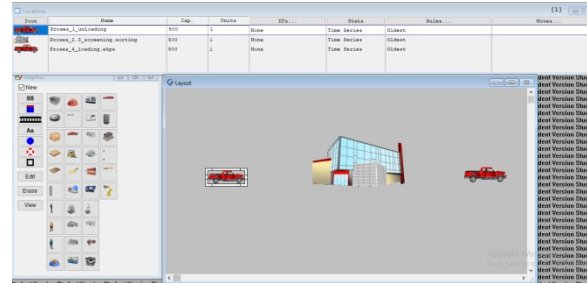
No	Proses	Rincian Proses	Waktu Proses (menit)
1	Proses Receiving and Putaway	Proses penerimaan barang dari supplier ke DC dan di input secara sistem yang kemudian disimpan dalam suatu tempat untuk memudahkan pada saat barang tersebut akan dikirim ataupun memudahkan melihat stok barang yang tersedia ditempat tersebut	120
2	Proses Dispatcing	Picking dan scanning barcode yang tertera pada vallet atau rak sebelum barang dimuat ke mobil ekspedisi	60
3	Stock take	isitilah ini merupakan suatu proses pemeriksaan barang satu terhadap semua stok barang yang ada di gudang untuk memvalidasi anatar fsk barang dengan dokumen	180
4	Proses Reporting	proses ini dilakukan setelah proses stock take selesai dilakukan, proses ini memastikan barang yang masuk, barang yang keluar dan sisa stok barang digudang sesuai dengan dokumentasi yang ada.	60
Total Waktu Proses			420

The results of simulation are:

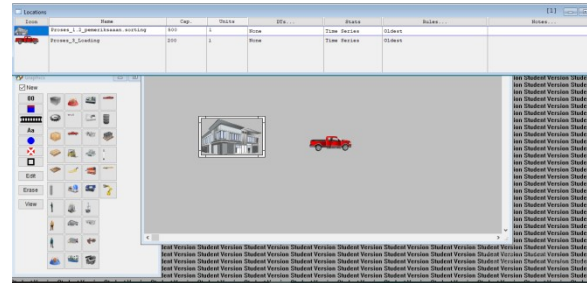
1. *Simulation in initial conditions*



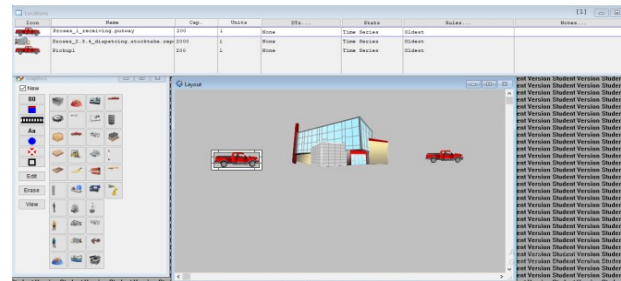
2. *Simulation in cross docking*



3. *Simulation in direct shipment*



4. *Simulation in warehousing*



5. *Table of comparison of simulation results*

Metode Distribusi	Hitungan manual			Persentase rata-rata Error
	Rata-rata			
Kondisi Awal				810
Cross docking				240
Direct Shipment				420
Warehousing				420
	Simulasi Promodel			
	Average time in system	Average time in operation	Rata-rata	
Kondisi Awal	1441,37	379,23		910,3
Cross docking	149,48	149,48		149,48
Direct Shipment	398,28	398,28		398,28
Warehousing	202,52	202,52		202,52
				38%
				95%
				48%

Leadtime comparison in distribution methods with manual calculations both in the initial conditions and in the SCM distribution method using Promodel software, namely in the manual calculation the initial condition distribution methods are generated, namely 810 minutes, 240 minutes crossdocking, 420 minutes direct shipment, and 420 minutes warehousing. Whereas the simulation results for initial conditions of 910 minutes, Crossdocking 149.48 minutes and has a percentage error value of 38%, Direct shipment 398.28 minutes and has a very large error value percentage of 95%,

and for warehousing 202.52 minutes and has the percentage of error values is 48%.

V. CONCLUSION

From the results of data collection and processing it can be concluded that of the three SCM distribution methods used, the variable variables used vary, depending on the method itself. Process simulations that exist in the SCM distribution method use the Promodel software to find out the fastest leadtime and the lowest percentage error value

The method chosen from the three supply chain management distribution methods is the Crossdocking method, because the results of the calculation have a 4% lower cost percentage compared to the others and with a 21% faster leadtime that is 240 minutes based on manual calculations and using a simulation simulation produces 149.48 minutes and has the smallest error value percentage that is 38% lower than other distribution methods.

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