# Case Study of Milk Run System Improvement in Distributor Company

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## Abstract

All companies' objective is to keep improving their performance in order to maintain the highest profit. Distribution is a crusial activity both for a company and a distributor company. It is about how the goods are delivered to consumers efficiently and effectively as possible. Distribution also requires cost, so its maximization or improvement is really important and can help the company reduce the distribution and transportation cost itself. Milk Run is one of the distribution methods which consolidates the delivery for some supplier in one vehicle at one time delivery. This paper analyzes distribution cost saving improvement using milk run system by comparing data of distribution activity collected before and after using the system with analytical descriptive and comparative methods. The results show cost efficiency and other potential benefit from using milk run system. However, the limitation of this paper is the cost saving efficiency is in terms of the fleet size and number of vehicles used only. Further research should look forward to other more perspectives.

**Keywords:** Milk run, Distribution, Transportation, Logistics

## Introduction

The global crisis has affected the performance of industries in Indonesia. The impact arising from this crisis was caused by a decrease in economic growth. Quoted from (Raz, Indra, Artikasih, & Citra, n.d.) research, developing countries is risky gets a negative impact of credits to private sectors because the country does not have well-established and better financial development yet, which are important factors in relationship between private capital flows and economic growth. So as to survive, the company strives to improve operational effectiveness and efficiency in order to obtain high profits and reduce costs as minimum as possible without reducing the quality of the goods or products.

As a result, distribution companies tried to improve their core activity requiring much of their operational cost. They switched their distribution system

from individual delivery or direct delivery into milk run system. There is some differentiation in terms of route and choice of vehicles. It affected the cost and its effectiveness. This paper will try to analyze whether milk run system contributes improvement in the fleet size and number of vehicles used or not, and if it does what the benefits that present.

Because supply chain efficiency research seeks to understand the productivity of supply chain members, and then use insights to improve distribution strategies and management policy refer to (Ross & Droge, 2004), management tried to find another strategy or distribution system in order to make an improvement. The concept of milk run Logistics obtained from the originates of the dairy industry with a call in which the vehicle is distributed and collects goods from several customers which then corresponds to a predetermined route. (Arvidsson, 2013). Determination of the route, schedule, time, type, and number of components to be sent can be determined by the milk run system. (Industri, Teknik, & Indonesia, 2011)

The idea of milk run logistics itself comes from the transportation of milk, namely there is a courier who delivers milk to each house with a predetermined route. This is to reduce the use of vehicle transportation when taking orders from low production demand, the vehicle for delivery begins to send goods at the same time every day and returns after all auto parts have been loaded. With the increase in business volume, the number of suppliers and auto parts, the original point-to-point delivery route has become increasingly ineffective which has increased overall operating costs. (Zhang, Zou, & Hu, 2016).

Milk run transportation network shares vehicles between suppliers or customers, because if only to fulfill individual orders it will not be possible to maximize the space available on the truck (Du, Wang, & Lu, 2007). The distance travelled and the number of vehicles used can make this milk run system efficient so in a minimum number, that can improve logistics efficiency in overall production and minimize the costs that come out. (Gyulai, Pfeiffer, Sobottka, & Váncza, 2013).

Milk run delivery is a shipment using a route where the truck is used to send products from one supplier to several retail (Federal et al., n.d.). Because milk run process looks carefully at the scheduling of vehicles, as the decision to receive or collect the goods, and the consequent consolidation of goods and routing to optimize routes and routines Some suppliers who use the milk run strategy can consolidate shipments where they combine products that will be shipped on a truck, then distribute to the targeted retail. The purpose of Milk run is to combine two shipments or from two suppliers or more using one truck, with once pick up in one route, by optimizing the transportation, so as to increase truck efficiency and produce relatively lower transportation costs.

Milk run is one of the advanced shipping concepts that can improve transportation management, because according to (Nemoto, Hayashi, & Hashimoto, 2010) Milk run delivery are a deal between suppliers of a company or several suppliers and the different cooperating companies and the delivery is done by the intermediaries business of logistics. With a milk run system shipping can occur load or unload of goods several times at different locations in the clear schedule and regularly.

There are main things of Milk Run such as Pick up time and schedule of loading and unloading which are determined exactly as well as volume and cycle issue by the DC and sequence of taking goods or products from one supplier to another one which has been standardized. However, the implementation is still must be evaluated and on time performance should be an important thing on this method in addition to safety and security factors of the delivery.

Milk run system have their objectives to minimize cost, reduce time and number of shipping. Costs will increase when the number of delivery facilities for the same request also increases and optimize the delivery route. From some previous researches that mentioning about the benefit of the milk run system are the objective of milk run is reduce stock, minimize costs, daily goods flow and make instant data flow compatible with the logistics needs of the supply network

(Federal et al., n.d.) and by (You & Jiao, 2014), fewer vehicles, shortened transport distance, improved load factor, all of that reduce the cost of logistics enterprises and improve the efficiency to some extent. Meanwhile, it can avoid the delay of goods and ensure the goods to be instantly and accurately transported, finally it will reduce the cost of its time and enhance the company competitive advantage over time.

Besides of the objectives and benefits that milk run system's have, there will be some threat for this system. Milk run have some weakness for their system for example, skid and pallets are probably to not return back to the suppliers own, but it also could return to others suppliers, so it have to be managed carefully (Acharya, 2009). If the suppliers are not ready for its components to be taken, thesn the supplier must send its own components. On time performance are needed for both of supplier and carrier.

**Method**

The study employed analytical descriptive and comparative methods. Analytical descriptive method is a method that attempts to describe the state of the company based on facts and data from the company, which then analyzes the data obtained to be discussed and made a conclusion about the state of the company. Comparative method is a method that compares the circumstances that occur with the proposal of the company. The data use a sample from a distribution of a pharmacy company as distribution center located in Pulo Gadung, Jakarta. The authors use the secondary data from the internal management observed in July 2018. The company delivers the products to the Regional Distribution Center (RDC). Samples taken from a supplier that deliver the product to 4 RDC (Cikarang, Dankos Farma, Pulo Gadung, and Pulo Mas). This research focuses on Milk run delivery system from fleet size and number of vehicles side. The actual number of trucks usage is averaged in every month for around 10 months to obtain the efficiency number of milk run system. The company uses CDD truck for their direct delivery to the RDC, where 4 CDD trucks is equal to 1 built up truck for

milk run system implementation. From the data of number of vehicles and differentiation of the fleet size between direct delivery using CDD and milk run system that using built up truck, the authors analyzes and compare the total cost needed and finally come to the result of how much the milk run system improvement contributes a potential cost saving for the company.

**Discussion and Result**

Products are distributed from their distribution center (DC) to other regional distribution centers. The distribution process is called primary movement 1 or area 1, which includes Cikarang, Dankos, Pulo Gadung, and Pulo Mas. Before improvement, the company used direct distribution from DC to each location in area 1. DC to Cikarang, DC to Dankos, DC to Pulo Gadung, and DC to Pulo Mas using CDD trucks. Table 1 is presenting data about how much CDD trucks needed when the distributor company using individual or direct delivery in ten months.

**Table 1. Data of CDD Truck**

| USE OF CDD TRUCKS PM1 JAKARTA | | | | | |
|---|---|---|---|---|---|
| | KF CIKARANG | DANKOS FARMA | PULO GADUNG | PULO MAS | TOTAL |
| Jan | 193 | 72 | 178 | 55 | 498 |
| Feb | 157 | 112 | 158 | 98 | 525 |
| Mar | 173 | 92 | 179 | 114 | 558 |
| Apr | 199 | 85 | 217 | 29 | 530 |
| May | 260 | 76 | 263 | 52 | 651 |
| Jun | 231 | 88 | 194 | 25 | 538 |
| Jul | 32 | 11 | 198 | 39 | 280 |
| Aug | 207 | 21 | 176 | 14 | 418 |
| Sep | 46 | 55 | 214 | 77 | 392 |
| Oct | 218 | 96 | 217 | 68 | 599 |
| Total Jan-Oct | 1716 | 708 | 1994 | 571 | 4989 |
| Ritase per Month | 172 | 71 | 199 | 57 | 499 |
| Ritase per Day | 9 | 4 | 10 | 3 | 25 |

With milk run system, the product is consolidated in bigger trucks or built up trucks and delivered at one time delivery. As a result, the distribution process becomes DC-Cikarang-Dankos-Pulo Gadung-Pulo Mas like the concept of milk run. Figure 1 illustrates the concept of individual or direct delivery and milk run system.
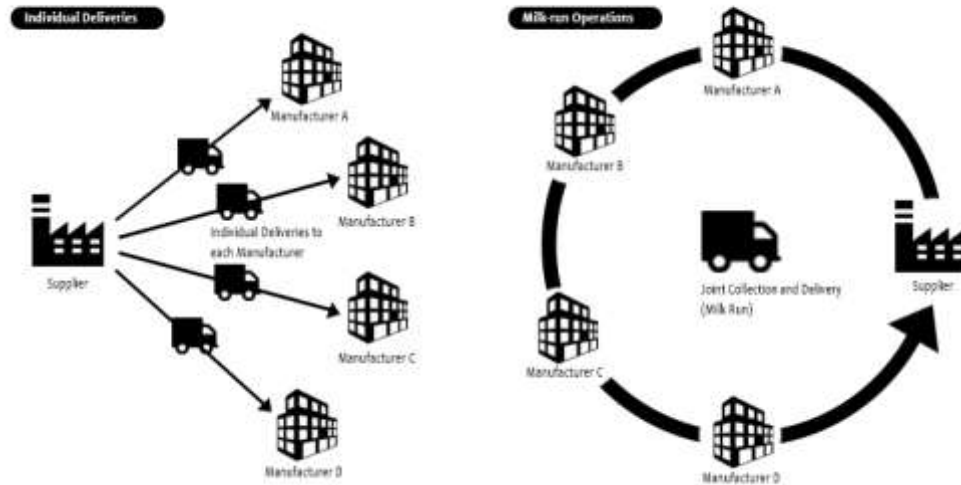
**Figure 1. The different delivery system between Individual deliveries and Milk run operations.**

While individual or direct delivery use CDD trucks, milk run system is using built up trucks and consolidates the products. One built up truck is equal to 4 CDD trucks. Figure 2 shows the comparison of number of vehicles in ten months if using all CDD trucks or individual or direct delivery and if using built up for milk run system. The total number is based on the data from Table 1.
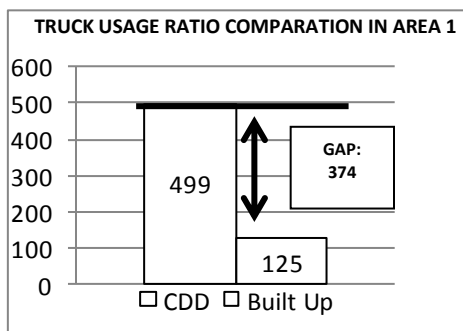


**Figure 2. Comparison Of CDD Trucks Needed And If Using Built Up Trucks**
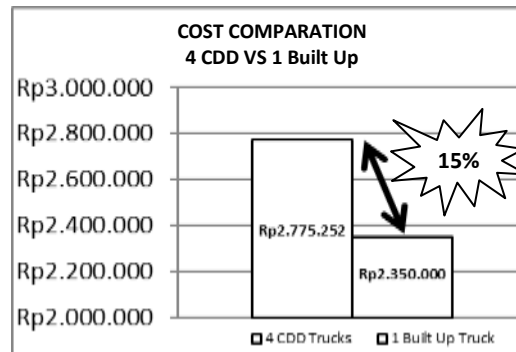


**Figure 3. Gap Of The Cost**

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By looking at the diagram, it clearly shows that there is a huge different of the number of vehicles needed. It is not only about it, but there is also a differentiation between the price of CDD truck and built up truck. Figure 3 shows the gap of required prices between CDD truck and built up truck, with an explanation that one CDD truck costs Rp 695,000 and one built up costs Rp 2,350,000. Even though the price of a built up is higher than a CDD, but with consolidation in milk run system, the company only needs 125 built up trucks compared to 499 CDD trucks which is still cheaper.

More detail result analysis through cost saving improvement after all these discussion is illustrated in this Table 2.

**Table 2. Analysis Improvement Comparing Individual Delivery and Milk Run System**

| AREA 1 | | | | | |
|---|---|---|---|---|---|
| **Indivual deliveries** | **Cikarang** | **Dankos** | **Pulo Gadung** | **Pulo Mas** | **Total** |
| CDD Ratio | 1716 | 708 | 1994 | 571 | **4989** |
| Average ratio per month | 172 | 71 | 199 | 57 | **499** |
| Total cost CDD per month | 119,540,000 | 49,345,000 | 138,305,000 | 39,615,000 | **346,805,000** |
| ⇩ | | | | | |
| **MILK RUN** | **Cikarang** | **Dankos** | **Pulo Gadung** | **Pulo Mas** | **Total** |
| Ratio Built up per month | 43 | 18 | 50 | 14 | **125** |
| Built up cost per month | | | | | 293,750,000 |
| Saving cost potential | | | | | 53,055,000 |
| Annual saving cost potential | | | | | 636,660,000 |

The top part of the table is the tabulation of the use of CDD trucks in every

regional DC. The total ten-month number shown is based on the actual data from Table 1 and then divided into monthly count. According to the price of CDD and built up truck and the number of CDD trucks, we can calculate the total cost needed every month in every regional DC. With a total of 499 CDD trucks per month (same as the calculation in Figure 2), the total cost needed for CDD trucks because of the use of individual or direct delivery is Rp 346,805,000.

In the bottom part of Table 2, it shows the calculation of built up trucks because the use of milk run system. A built up truck is equal to 4 CDD trucks. The number of built up trucks per month per regional DC is showed and as explained in Figure 2, the total reaches 125 built up trucks needed with the total cost Rp 293,750,000.

After analyzing the total cost needed for individual or direct delivery and milk run system, it can be observed some differences between them. Milk run system requires lower total cost compared to individual or direct delivery. The company may obtain the potential of cost saving improvement around Rp 53,055,000 every month and Rp 636,660,000 every year.

## Conclusion

The result of this research shows that milk run application brings more efficiency for the company compare to individual or direct delivery method. This answers the research question if Milk Run system gives improvement to the company and brings some several benefits. Milk run does decrease the number of loading unit and decrease the total logistics cost. With the secondary data obtained from the company and analysis of the data Table 3 shows the important summary as an illustration.

**Table 3. Summary of Result**

| Category | Before Improvement | After Improvement | Cost Saving in 1 month | Cost Saving in 1 year |
|---|---|---|---|---|
| **Area 1** | **346,805,000** | **293,750,000** | **53,055,000** | **636,660,000** |

The Milk Run system enables to give an improvement by minimize the delivery cost with integrating several suppliers into one route, at one time, within the capacity of trucks total delivery volume.

However, this study only focuses on the fleet size and number of vehicles which implies the limitation of this paper can be done in further research such as vehicle route problems and delivery volume, considering that milk run system requires complex integration in terms of time, loading and unloading schedules, volume and routing to be implemented.

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