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The Application of Milkrun to Reduce Transportation Costs for Automotive After Sales Products during Covid-19 Pandemic: Case Study

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Astract

The Covid-19 pandemic has put all businesses in a downturn. This has an impact on the After Sales business such as service parts, accessories, and domestic in-house parts due to the Covid19 pandemic. During the Covid-19 was a very difficult year for the four-wheeled automotive industry in Indonesia where sales decreased drastically from an average of not less than 1 million units to only 600 units a year. This study aims to reduce transportation costs during ongoing business processes. The method used is Milk-run. The research results found that the calculation of transportation costs, it is found that the transportation costs in FY20 are 4,809 MIDR per year because the supplier directly sends the product to the customer so the transportation cost is based on the distance between the supplier and the customer. By using the milk run method, transportation costs can be reduced to 3,219 MIDR because the moving transporters take parts from several suppliers that are quite close

Keywords: After Sales, Automotive Industry, Milk-run, Pandemic

1. Introduction

Fiscall Year (FY) 20, was a very difficult year for the four-wheeled automotive industry in Indonesia where sales decreased drastically from an average of not less than 1 million units to only 600 units a year (Gaikindo 2020). This has an impact on the After Sales business such as service parts, accessories, and domestic in-house parts due to the Covid19 pandemic. One of the four-wheeled automotive industries in the GIIC industrial area, Cikarang, decreased the profit ratio from 39.43% to 30.21%. This requires the after-sales division to reduce the cost of transporting parts from suppliers where transportation costs are the largest cost component in this division. I try to propose the application of milk-run in reducing the cost of transportation and inventory in warehouses (Adriano et al., 2020; Klenk & Galka, 2019; Mao et al., 2020; Ranjbaran et al., 2020). Where Milk-run is the most effective method for reducing costs such as transportation and inventory (Tamas Banyai 2018). The following comparison of sales profits with operations can be seen in Figure 1. This study aims to reduce transportation costs during ongoing business processes.

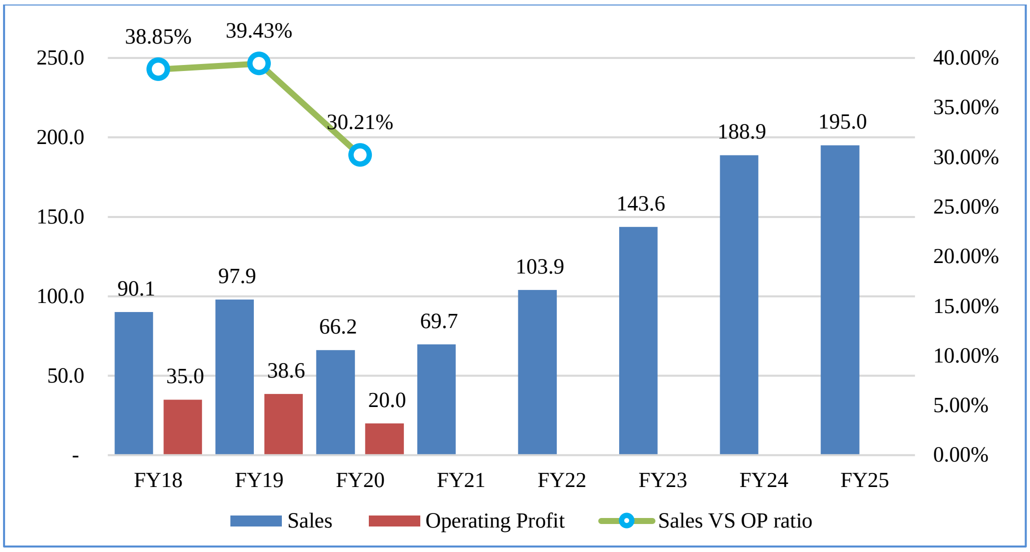


Figure 1. Sales vs Operation Profit

2. Method

The title of this study uses the Milkrun method to obtain optimal transportation costs (Bocewicz et al., 2019) (Teschemacher & Reinhart, 2017)(Mácsay & Bányai, 2017). Previous research used the Milkrun method to obtain an optimal delivery process (Mei et al., 2017; Purba et al., 2019; Wu et al., 2018). Milkrun can reduce costs, fast delivery times, and increase productivity (Greenwood et al., 2017; Kluska & Pawlewski, 2018; Purba et al., 2019; Tellini et al., 2019). Data was obtained through company reports during FY20. Several stages are required to get a good finishing concept. The following research framework can be seen in Figure 2.

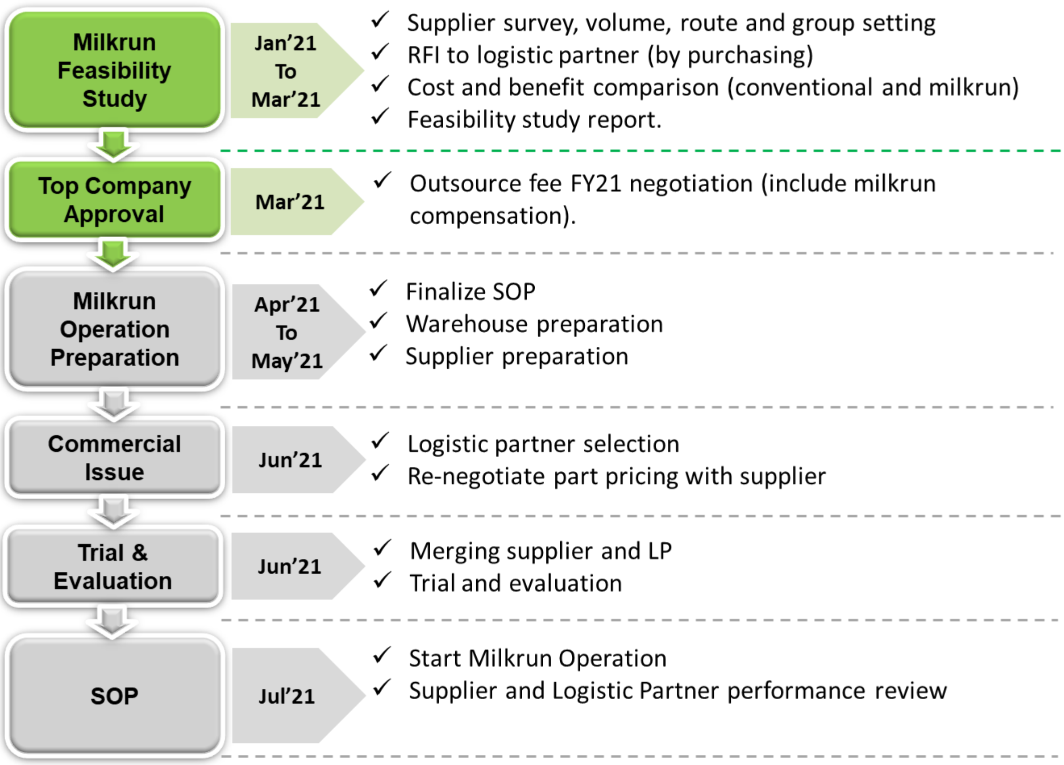


Figure 2. Study Framework

3. Analysis and Result

3.1. Milkrun Concept

The initial stage is to define the concept of fleet travel in cases that state problems. Then analyze the route and cost factors. Where the fleet travel process is carried out directly in transit at each company. The following initial concept analysis can be seen in Figure 3.

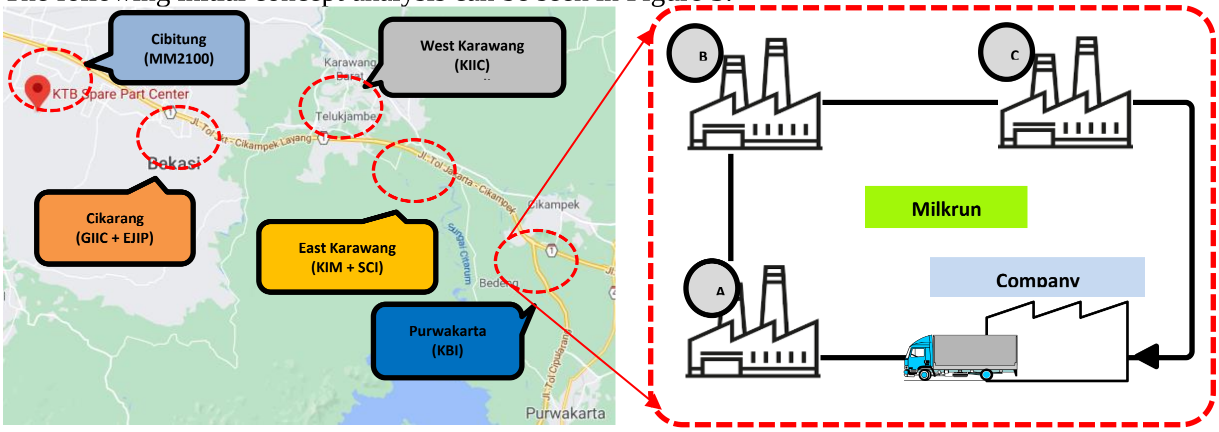
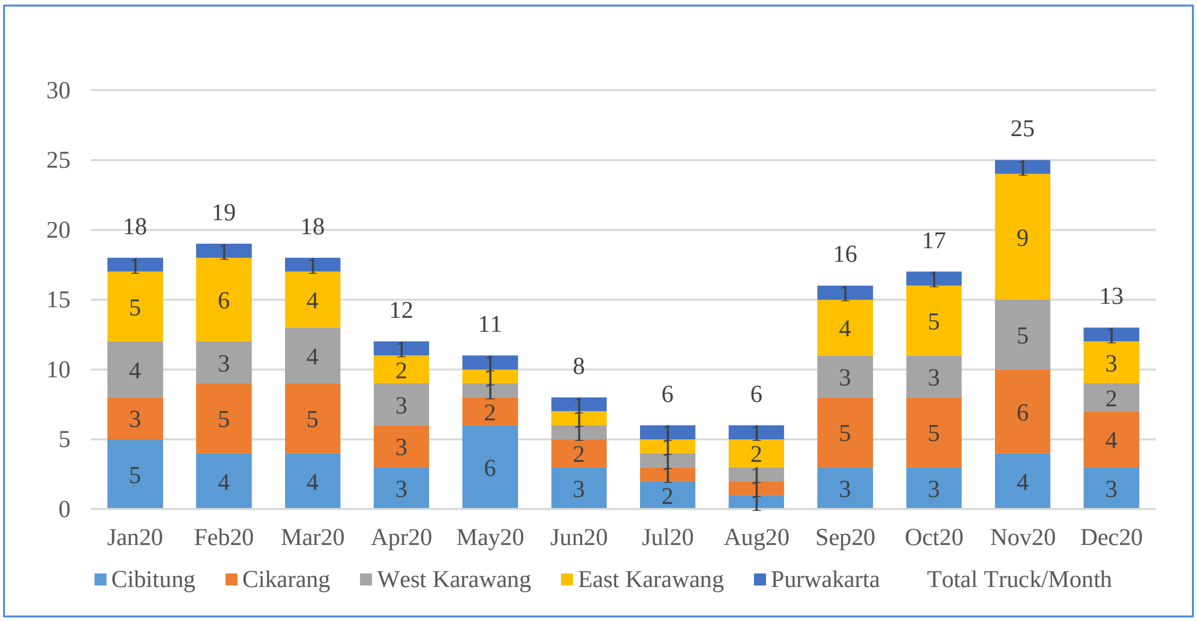


Figure 3. Simulation siklus conceps Milk-run

Due to After Sales orders being very fluctuated, therefore, we will manage milk run flexibility by changing the milk run route cycle daily, based on the milk run cycle ratio. Below is the sampling scheme can be seen in Figure 4.



Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Figure 4. Total Truck Milkrun

3.2. Business Impact – Cost Reduction

Table 2. Inventory Cost (FY20)

Area	Suplier	Transport Direct	Direct Method	Milkrun Method
Cibitung	Kayaba	Rp 550.700	Rp 2.792.040	Rp 1.776.000
Cibitung	Autobody	Rp 560.000		
Cibitung	Ichikoh	Rp 570.000		
Cibitung	Sekiso	Rp 564.590		
Cibitung	Autoliv	Rp 546.750		
Cikarang	Autrans	Rp 610.300	Rp 2.503.800	Rp 1.745.000
Cikarang	Ikuyo	Rp 623.000		
Cikarang	Autocomp	Rp 625.500		
Cikarang	Enkei	Rp 645.000		
Karawang Barat	ITSP	Rp 685.000	Rp 2.775.000	Rp 1.911.000
Karawang Barat	Penstone	Rp 704.000		
Karawang Barat	Ichii	Rp 685.000		
Karawang Barat	Kyoraku	Rp 701.000		
Karawang Timur	Sakae	Rp 774.000	Rp 3.791.700	Rp 2.021.000
Karawang Timur	Ansei	Rp 750.000		
Karawang Timur	Tokai Rika safety	Rp 756.800		
Karawang Timur	Hiruta	Rp 765.900		
Karawang Timur	Nifco	Rp 745.000		
Purwakarta	Valeo	Rp 812.500	Rp 2.449.000	Rp 2.127.800
Purwakarta	Sumi Indo	Rp 820.800		
Purwakarta	Mitsuba	Rp 815.700		
			Rp 14.311.540	**Rp 9.580.800**

- Inventory Cost

Improvement using the milk run method we can reduce the warehouse area by 40% automatically reducing warehouse rental costs. This data can be seen in Table 2.

Table 2. Inventory Cost (FY20)

Transportation Method	Space (m2)	Price (m2)	Price per Month Total	Price per Year Total
Direct	2.000	80.000	Rp 160.000.000	Rp 1.920.000.000
Milkrun	1.200	80.000	Rp 96.000.000	Rp 1.152.000.000
Reduction				**Rp 768.000.000**

- Forecast cycle concepts Milk-run Truck Per Year

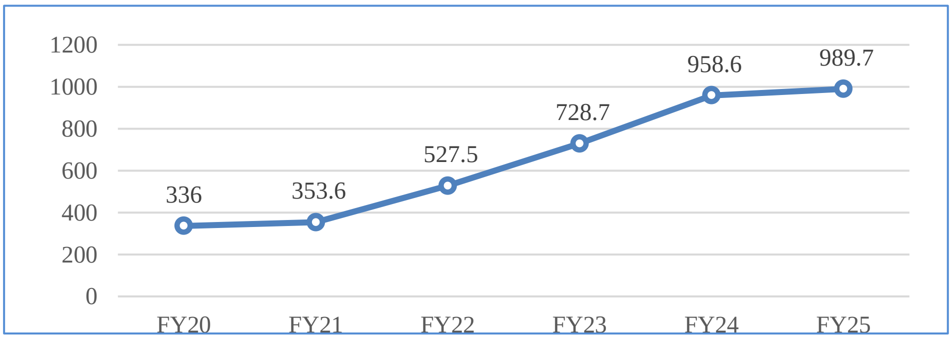


Figure 5. Forecast cycle concepts Milk-run Truck per year

3.3. Cost Reduction Total

After making changes to the transportation system, the overall cost reduction was obtained. This decrease resulted in lower costs which resulted in the good productivity of transportation activities during FY25 increasing rapidly. The following reduction in costs for 5 FY can be seen in Figure 6.

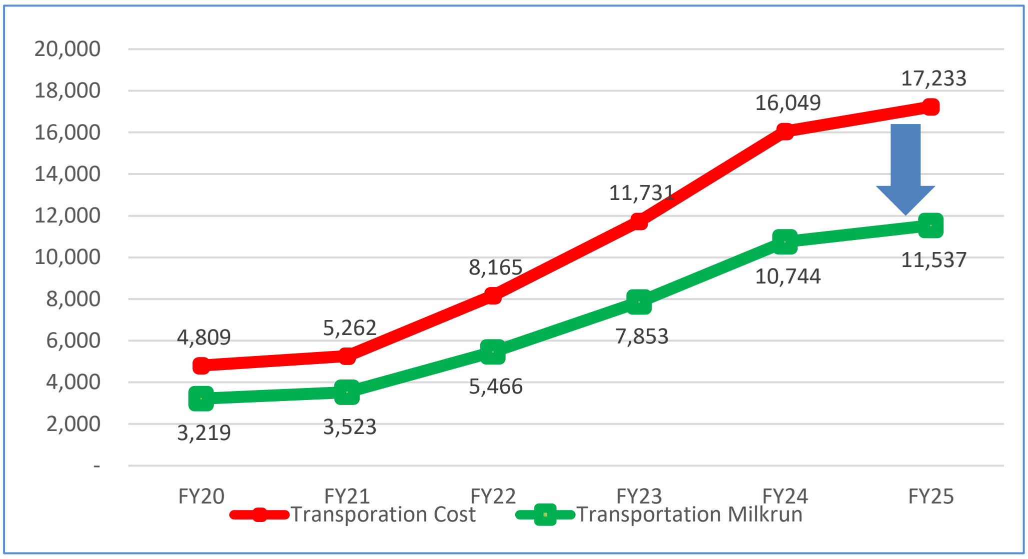


Figure 6. Milk-run Cost Reduction (MIDR)

To be more detailed in the inventory cost calculation, in the future, we will calculate the inventory cost components more completely, such as the use of warehouse manpower, the electricity used, and others. To control transportation from supplier to customer, it needs to be combined with digital technology (Industri 4.0) such as GPS which can monitor transportation lead time in real-time and respond quickly to abnormalities on the road. This data can be seen in Table 2. Inventory Cost (FY20)

4. Conclusion

Based on the calculation of transportation costs, it is found that the transportation costs in FY20 are 4,809 MIDR per year because the supplier directly sends the product to the customer so the transportation cost is based on the distance between the supplier and the customer. By using the milk run method, transportation costs can be reduced to 3,219 MIDR because the moving transporters take parts from several suppliers that are quite close (adjacent areas). The impact of the application of this milk run method, the area of warehouse requirements has decreased drastically from 2000 m2 to 1200 m2, where the inventory costs for renting a warehouse have also been reduced from 1,920 MIDR to 1,152 MIDR, degrees saving cost from 39,43% to 30,21%.

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