



ANALYSIS OF SUPPLY CHAIN MANAGEMENT ON OPERATIONAL PERFORMANCE OF AUTOMOTIVE COMPANIES

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Abstract

The research aims to determine the influence of supply chain management on the operational performance of the YAMAHA-authorized dealers (YSS) in Bogor and surrounding areas. Respondents to this study were 30 people representing ten YSS. Data collection using questionnaires and analysis using validity test, reliability test, F-test, and multiple regression analysis with the SPSS ver.22. The results of this study indicate that supply chain management has a partial and simultaneous influence on operational performance. Information sharing has a significant effect on operational performance. Long-term relationships have a significant influence on operational performance. Process integration has a significant influence on operational performance, and the delivery system has a significant influence on operational performance at YSS.

Keywords: *delivery system information sharing, multiple regression analysis, operational performance, process integration, supply chain management*

INTRODUCTION

Business competition in various sectors, particularly in the service sector, in the current post-Covid-19 free market conditions has increasingly prompted businesspeople to look for surefire ways to survive. The company must meet the market requirements for service, and product quality, reducing costs to a minimum, consistently high company performance, and increasing customer satisfaction. Applying supply chain management is one of the ways for companies to remain competitive and survive.

Oliveira-Dias et al. (2022) point out that the Lean Supply Chain (LSC) strategy focuses on

eliminating waste and activities that do not Add value supply chain. Moreover, it is associated with planning in low-uncertainty environments. At the same time, the Agile Supply Chain (ASC) strategy focuses on the ability to meet market demands and the capacity required to meet fluctuating market demands. Supply chain efficiency focuses on the company's efforts to meet consumer demand at the lowest price by minimizing overall costs (low-cost strategy). In contrast, a responsive supply chain focuses on efforts to quickly respond to consumer demand to reduce inventory in Support of anticipation of uncertain demand and anticipate fluctuations in supply from suppliers (innovative strategy). Supply chain sustainability has received increasing attention in recent decades, and sustainability and resilience are essential for supply chains (Fahimnia et al., 2019). Some people have recently claimed that incorporating sustainability into business

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operations can increase business performance (Pinto, 2020). The critical role of suppliers, factories, distributors, retailers, and consumers in creating cheap, high-quality, and fast products will bring forth the concept of supply chain management. Inventory in a business is a crucial factor in the success and failure of a business, so a business needs to implement effective inventory management to minimize customer churn due to unfulfilled requests (Husaini & Hunter, 2022).

The problem of supply chain management is an operational problem that often becomes a problem in companies, especially motorcycle workshops, especially in the supply of spare parts. Likewise, in this YAMAHA-authorized workshop, its performance will decrease unless the shop can meet consumer demand. The motorcycle, which should have been repaired in the official workshop, had to be rejected due to the unavailability of spare parts. Alternatively, the motorcycle is badly damaged and has to stay overnight in the garage until the required spare parts arrive, which incurs costs for storing the overnight motorcycle.

Business performance is a term that encompasses economic aspects and operational aspects, and business performance is also an umbrella term for all concepts that affect the success of a company and its activities (Ling Piao, Purwanto, & Purnaweni, 2022). Unavailability of spare parts in the workshop due to late delivery of supplies. It is detrimental to consumers who wait too long, hampering the workshop's operational efficiency and resulting in material losses and reduced customer retention.

With strategic supply chain management, companies can reduce the storage of goods in department stores. Inventory is one of the company's most important assets. A new method has been found to solve inventory problems. Maintaining the relationship between suppliers and end users is very influential, as the stakeholders are interdependent. Properly integrated supply chain management can achieve what the company expects regarding customer satisfaction (Sianturi & Oklilas, 2022).

The research questions formulated are: 1) How does supply chain management influence operational performance in YAMAHA-authorized dealers?; 2) What supply chain management factors affect operational performance at YAMAHA-authorized dealers?

LITERATURE REVIEW

Supply Chain Management

Supply chain management is the management of various activities in the process of sourcing raw materials, followed by transforming the form so that it becomes a product in the process, then becomes a finished product, and continues with delivery to customers through a distribution system. The activities attempted include conventional purchasing and various other meaningful activities related to suppliers and agents. In supply chain management, strategy starts from agent to end customer by categorizing operational strategies to market demand or energy source available for reference. Supply chain management has an important goal that is expectedly to recognize the supply chain management strategy so that the industry can compete in the market and win the competition, hopefully through knowledge of the strategy (Batubara & Aisyah, 2022).

SCM is not a new concept, but its importance to highlighted in recent years with the effects of the pandemic. It has written about supply chains and their management in service and manufacturing industries since the term found in the 1980s. Although service and manufacturing companies differ in many ways, the most important being that one offers services and another offers physical products. The reality is that this pure distinction is becoming more challenging to make as most companies have evolved to some combination of both (Rabetino et al., 2018; Li et al., 2020).

H₁: Supply chain management influences operational performance

Information Sharing

Information is a collection of data that has been grouped, processed, and communicated

for practical, meaningful, or valuable needs. Therefore, information is used as a basis for making decisions that must obtain quickly and of good quality. Information is the basis for implementing supply chain processes. The success of the supply chain depends on the information system; with the information on business partners in the supply chain, it can calculate. Lack of coordination from the parties involved in the supply chain will cause information distortion called the bullwhip effect phenomenon. Meanwhile, the Bullwhip Effect is an increase in demand variability at each level of the supply chain due to information distortion (Panjaitan, Hasibuan, & Aisyah, 2022).

Information sharing improves all three dimensions of supply chain learning, and internal and customer learning directly influences flexibility performance. In contrast, internal learning mediates the relationship between supplier learning and flexibility performance (Huo et al., 2021).

H₂: Information Sharing influences Operational Performance

Long-term Relationship

The company's relationship with suppliers is the most substantial collaboration within a value or supply chain. An excellent long-term relationship can improve each party's performance. Further argue that by engaging in long-term relationships, firms in supply chains also can reduce the risk and improve their overall sustainability (Negri et al., 2021). The company must manage the relationships between suppliers and customers appropriately and constantly improve to establish sustainable relationships. Suppliers are also responsible for product quality and distribution from upstream to downstream to end users on time. Therefore, an increase in good long-term relationships and mutual trust between companies, suppliers, and customers are required to achieve efficient company performance (Alshurideh et al., 2022).

H₃: Long-term Relationship influences Operational Performance

Process Integration

In the literature review research by Yusuf and Soediantono (2022), according to Epiphaniou et al. (2020); Esmailian et al. (2020); Fatorachian et al. (2021); Hahn et al. (2020); Haudi et al. (2022) Supply chain management is an integrative method or approach for managing the flow of products, information, and money in an integrated manner involving parties from upstream to downstream consisting of suppliers, factories, distribution networks, and logistics services. According to Haudi et al. (2022) Supply chain is an integrated process in which many entities work together to obtain raw materials, convert raw materials into finished products, and send them to retailers and customers. Supply chain management integrates materials and service procurement activities, conversion into semi-finished goods and final products, and delivery to consumers or customers.

H₄: Process Integration influences Operational Performance

Delivery System

One of the processes in supply chain management is a delivery system that will help companies in the commodity or goods process network from suppliers to end users. In their research Oktalia et al. (2022), SCOR is divided into 5 supply chain processes. The following is an explanation of the division of the 5 supply chain processes.

Plan

It is a process of balancing requirements and supply to determine the ability to meet the needs of procurement, production and delivery. This plan is the planning of all inventories, production, materials, capacity and supply chain adjustment plan with the financial plan.

Source

It is the process of scheduling orders such as shipping, checking, receiving, and receiving invoices from suppliers. Therefore, this process

can depend on the item including stocked, make-to-order, or engineer-to-order products.

Make

It is producing raw materials into raw materials according to the wishes of consumers. This production process is carried out to fulfill orders (make-to-order), target stock (make-to-stock), or engineer-to-order. The process carried out is to schedule production, repair, carry out quality checks, manage raw materials to semi-finished goods, and so on.

Deliver

It is fulfilling customer orders, creation, and maintenance. These processes include distribution, order management, and transportation. The process carried out is making consumer orders, scheduling goods shipments, and sending invoices to customers.

Return

It is a process of receiving product returns due to various reasons. This activity involves product conditions, policies for returning defective products, to returning products, Post-delivery-customer-support is also part of the return process.

H₅: Delivery system influences operational performance

Operational Performance

According to Naufal (2018), operational performance is the performance of management activities that include designing, updating, monitoring, and operating production systems. In other words, operational performance is a measure of the company's results compared to set standards. In a company, operational performance is achieving the corporate strategy, and the company can measure and find that operational performance. In research, Oktalia et al. (2022) said that running a supply chain system can meet consumer demand, maximize profits, and reduce production costs. Research conducted using qualitative analysis methods to obtain results from the implementation of the system will result in convenience for all

divisions to make operational performance more effective and efficient.

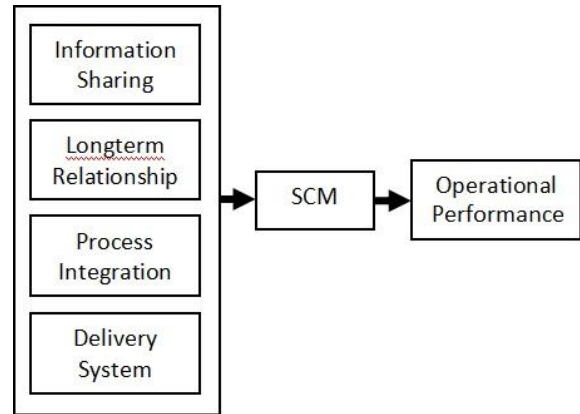


Figure 1. Proposed Research Model

METHODS

The subject of this study is the official Yamaha dealership in Bogor and the surrounding area. This company sells motorcycle units, spare parts, and repairs. This research object conducts to find out the company's supply chain management (SCM) applied by the company to the operational performance of the company.

The research uses descriptive qualitative research, where the results systematically describe how the authorized Yamaha dealer implements information sharing, long-term relationships, process integration, and supply chain delivery systems implemented to improve operational performance (Figure 1). Qualitative analysis methods include data collection, processing, presentation, and description. This data collection method obtains the necessary information or data sources. By collecting data directly from 10 authorized Yamaha dealers in Bogor and the surrounding area, existing data can strengthen, and the condition of objects can be described based on facts within the company. The facts obtained did compile to further processing into conclusions. This method uses primary data sources, and data collection is done directly from the research subjects via a questionnaire (Zai et al., 2022).

Primary data analysis is a research strategy that uses existing quantitative data to find problems, which are then analyzed using SPSS

version 22. Secondary data is then collected to support the problems under study (Romanto, Handoko, & Kiswandono, 2022). Getting data from the company by knowing the components included in the company hopes that research and problem-solving can do more quickly.

RESULTS AND DISCUSSIONS

Based on the research results conducted on 30 respondents data analysis test aimed to describe the results of the descriptive analysis obtained from the distributed questionnaires. The data analysis tests performed for characteristics of respondents are presented in Figure 2, Figure 3, Figure 4, and Figure 5.

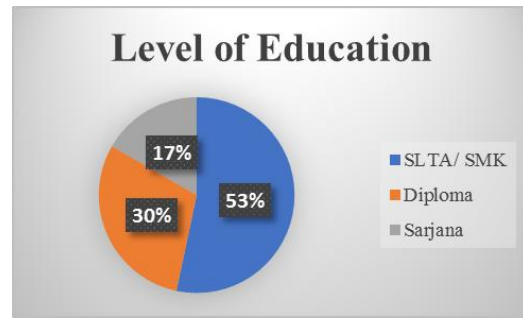


Figure 5. Level of Education

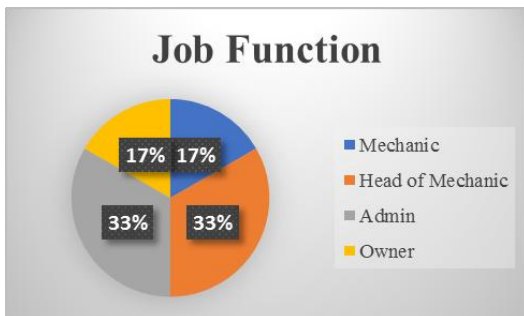


Figure 2. Job Function of respondents

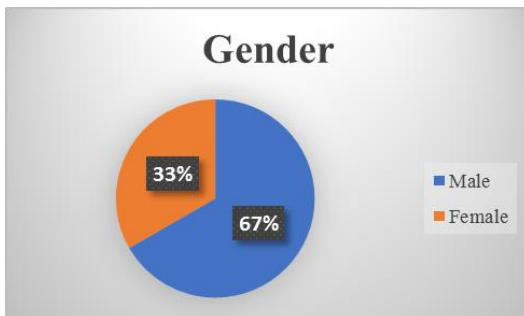


Figure 3. Gender of respondents

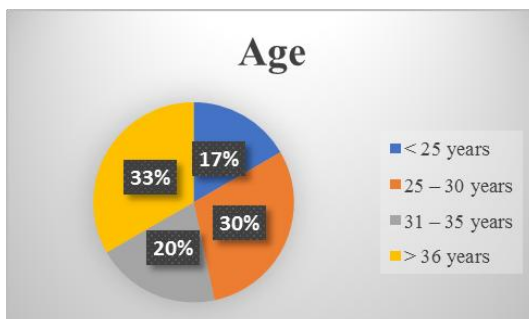


Figure 4. Age of respondents

Validity Test

Table 1. *Validity Test Information Sharing*

	Pearson Correlation	Sig. (2-tailed)	N
X _{1.1}	0,790**	0,000	30
X _{1.2}	0,790**	0,000	30
X _{1.3}	0,767**	0,000	30
X _{1.4}	0,636**	0,000	30
X ₁	1		30

The overall statement on the information sharing variable has a calculated r-value of 0,79; 0,79; 0,767; 0,636 is larger than r table which has a value of 0,361. Table 1 concludes that all statements on the information sharing variable have no invalid statement points; in other words, all statement points are valid.

Table 2. *Validity Test Long-term Relationship*

	Pearson Correlation	Sig. (2-tailed)	N
X _{2.1}	0,873**	0,000	30
X _{2.2}	0,933**	0,000	30
X _{2.3}	0,879**	0,000	30
X ₂	1		30

The overall statement on the long-term relationship variable has a calculated r-value of 0,873; 0,933; 0,879 is larger than r table which has a value of 0,361. Table 2 shows that all statements on the long-term relationship variable have no invalid statement points; in other words, all statement points are valid.

Table 3. *Validity Test Process Integration*

	Pearson Correlation	Sig. (2-tailed)	N
X _{3.1}	0,707**	0,000	30
X _{3.2}	0,701**	0,000	30
X _{3.3}	0,577**	0,001	30
X _{3.4}	0,816**	0,000	30
X ₃	1		30

The overall statement on the process integration variable has a calculated r-value of 0,707; 0,701; 0,577; 0,816 is larger than r table which has a value of 0,361. It can be concluded that all statements on the process integration variable have no invalid statement points; in other words, all statement points are valid.

Table 4. *Validity Test Delivery System*

	Pearson Correlation	Sig. (2-tailed)	N
X _{4.1}	0,725**	0,000	30
X _{4.2}	0,519**	0,003	30
X _{4.3}	0,704**	0,000	30
X _{4.4}	0,733**	0,000	30
X _{4.5}	0,664**	0,000	30
X _{4.6}	0,884**	0,000	30
X _{4.7}	0,912**	0,000	30
X _{4.8}	0,555**	0,001	30
X _{4.9}	0,834**	0,000	30
X _{4.10}	0,787**	0,000	30
X _{4.11}	0,751**	0,000	30
X ₄	1		30

The overall statement on the delivery system variable has a calculated r-value of 0,725; 0,519; 0,704; 0,733; 0,664; 0,884; 0,912; 0,555; 0,834; 0,787; 0,751 is larger than r table which has a value of 0,361. Table 4 concludes that all statements on the delivery system variable have no invalid statement points; in other words, all statement points are valid.

Table 5. *Validity Test Operational Performance*

	Pearson Correlation	Sig. (2-tailed)	N
Y _{1.1}	0,998**	0,000	31

Y _{1.2}	1,000**	0,000	31
Y _{1.3}	1,000**	0,000	31
Y _{1.4}	1,000**	0,000	31
Y _{1.5}	0,998**	0,000	31
Y _{1.6}	0,997**	0,000	31
Y _{1.7}	0,999**	0,000	31
Y _{1.8}	1,000**	0,000	31
Y _{1.9}	1,000**	0,000	31
Y _{1.10}	1,000**	0,000	31
Y	1		31

Table 5 shows that all statements about the operational performance variable have a calculated r-value is larger than r table, which has a value of 0,361. It can be concluded that all statements on the operational performance variable have no invalid statement points; in other words, all statement points are valid.

Reliability Test

Table 6 shows that the value of Cronbach's alpha on the variables information sharing, long-term relationship, process integration, delivery system and operational performance has a value greater than 0,7, so it can be concluded that all statements on the variables are reliable.

Table 6. *Reliability Test*

Cronbach's Alpha	N of Items
0,996	10

Normality Test

Based on the output results of the normality test conducted with SPSS software with 30 respondents through the decision-making of the sig value in the Kolmogorov-Smirnov table, the sig value of 0,968 is greater than the value of (alpha) of 0,05. From this, it can be concluded that the data used are normally distributed.

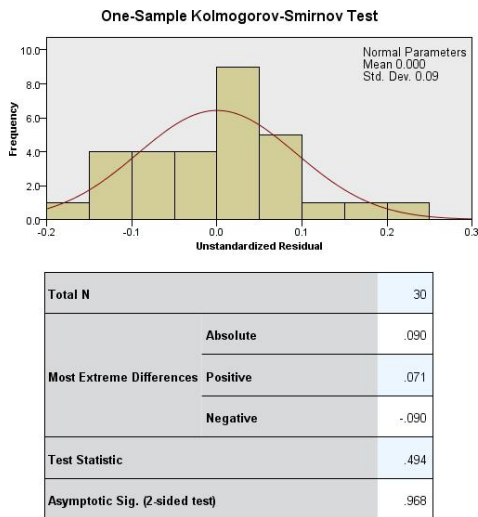


Figure 6. Normality Test

Coefficient of Determination Test

Table 7. Coefficient of Determination Test

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	0,950 ^a	0,902	0,886	0,10020

a. Predictors: (Constant), X₄, X₂, X₃, X₁

Table 7 shows that R² results are 0,886, which means 88,6%, indicating that the variables information sharing, long-term relationship, process integration, delivery system are fluctuations in the variable operational performance, and the remaining 11,4 % are explained by other variables. which was not measured.

F-Test

Table 8. F-Test

Model	ANOVA ^a				Sig
	Sum of Squares	Df	Mean Square	F	
Regression	2,304	4	0,576	57,357	0,000 ^b
1 Residual	0,251	25	0,010		
Total	2,555	29			

a. Dependent Variable: Y

b. Predictors: (Constant), X₄, X₂, X₃, X₁

In Table 8, the calculated F value is 57,357, greater than the table value of 2,75. Its also supported by the calculation results based on the Sig value of 0,000, which is smaller than the alpha value of 0,05. The results of the two calculations show that the variables information sharing, long-term relationship,

process integration, delivery system simultaneously significantly correlate with the variable operational performance.

Multiple Regression Analysis

Table 9. Multiple Regression Analysis

Model	Coefficients ^a			T	Sig.
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
(Constant)	0,507	0,183	-	2,771	0,010
X ₁	0,507	0,097	0,690	5,233	0,000
1 X ₂	0,143	0,057	0,217	2,504	0,019
X ₃	0,172	0,067	0,301	2,558	0,017
X ₄	-0,115	0,055	-0,215	-	0,049
				2,072	

a. Dependent Variable: Y

Multiple regression equation is obtained as follows:

$$\hat{Y} = 0,507 + 0,507 X_1 + 0,143X_2 + 0,172X_3 - 0,115X_4$$

The information about the multiple regression equation are provided:

- Y : Operational Performance
- X₁ : Information Sharing
- X₂ : Long-term Relationship
- X₃ : Process Integration
- X₄ : Delivery System

Table 9 shows that the constant value obtained is 0,507, resulting in a positive value indicating a indirectional effect between the independent and dependent variables. If the variables X₁, X₂, X₃ and X₄ equal to 0 (zero), then the variable Y is 0,507 or does not change.

The regression coefficient value for the variable X₁ is 0,507. It can be interpreted if the variable X₁ increases by 1 point, assuming that variable X₂, X₃, X₄ and the constant value is 0 (zero). The degree of operational performance variable (Y) increases by 0.507. Conversely, suppose the variable X₁ decreases by 1 point, assuming that variable X₂, X₃, X₄ and the constant value is 0 (zero). In that case, the level of operational performance (Y) is reduced by 0,507. Such shows that the offered information sharing (X₁) makes a positive contribution, and there is a indirectional impact on the level of operational performance (Y).

The regression coefficient value for the variable X_2 is 0,143. It can be interpreted if the variable X_2 increases by 1 point, assuming that variable X_1 , X_3 , X_4 and the constant value is 0 (zero). The degree of operational performance variable (Y) increases by 0,143. Conversely, suppose the variable X_2 decreases by 1 point, assuming that variable X_1 , X_3 , X_4 and the constant value is 0 (zero). In that case, the level of operational performance (Y) is reduced by 0,143. Such shows that the offered long-term relationship (X_2) makes a positive contribution, and there is a indirectional impact on the level of operational performance (Y).

The regression coefficient value for the variable X_3 is 0,172. It can be interpreted if the variable X_3 increases by 1 point, assuming that variable X_1 , X_2 , X_4 and the constant value is 0 (zero). The degree of operational performance variable (Y) increases by 0,172. Conversely, suppose the variable X_3 decreases by 1 point, assuming that variable X_1 , X_2 , X_4 and the constant value is 0 (zero). In that case, the level of operational performance (Y) is reduced by 0,172. Such shows that the offered process integration (X_3) makes a positive contribution, and there is a indirectional impact on the level of operational performance (Y).

The regression coefficient value for the variable X_4 is -0,115. It can be interpreted if the variable X_4 increases by 1 point, assuming that variable X_1 , X_2 , X_3 and the constant value is 0 (zero). The degree of operational performance variable (Y) reduced by 0,115. Conversely, suppose the variable X_4 increases by 1 point, assuming that variable X_1 , X_2 , X_3 and the constant value is 0 (zero). In that case, the level of operational performance (Y) is increases by 0,115. Such shows that the offered delivery system (X_4) makes a negative contribution, and there is a indirectional impact on the level of operational performance (Y).

The research results are consistent with research by previous researchers who said that operational performance can be measure from all activities in organization such as information sharing and process integration (Naufal, 2018). And An excellent long-term relationship can

improve operational performance (Negri et.al, 2021).

CONCLUSIONS

Based on the analysis results through questionnaires distributed to 30 respondents at ten authorized YAMAHA dealers in Bogor and its surroundings, it can be concluded that supply chain management partially influences operational performance with a value of $t = 2,771$ and simultaneously influences F value = 57,357. Information sharing with a value of $t = 5,233$; Long-term relationship with a value of $t = 2,504$; Process integration with a value of $t = 2,558$ has a significant effect on operational performance, while the Delivery system has a significant effect on operational performance with a negative correlation because of the value of $t = -2,072$. From the results of the simultaneous analysis that the supply chain management described by the independent variables has a coefficient of determination (adjusted R^2) of 0,886, which means that 88,6% of variations or changes in operational performance (Y) at YSS authorized dealers have influenced by the information sharing variable (X_1), long-term relationship variable (X_2), process integration variable (X_3), and delivery system variable (X_4). While the remaining 11,7% described by other variables was not measured in this study. With the multiple regression function, the research gets $Y = 0,057 + 0,057X_1 + 0,143X_2 + 0,172X_3 - 0,115X_4$

Research limitations

This research only took samples from 10 authorized YAMAHA dealers in Bogor and its surroundings. Future researchers can expand sampling with a more significant number of respondents for each official dealer so that the analysis results can be more comprehensive. The use of variables can be expanded further by trying other variables besides those measured in the research.

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