



## THE EFFECT OF SUPPLY CHAIN RESPONSIVENESS, FLEXIBILITY, & QUALITY ON CUSTOMER DEVELOPMENT

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### Abstract:

*This study examines the impact of supply chain responsiveness, flexibility, and quality on a firm's ability to attract, satisfy and retain its customers. Moreover, mediating impact of logistics process responsiveness among operation system responsiveness, supplier network responsiveness, supply chain flexibility, supply chain quality, and customer development is examined as well. For this study we have used the quantitative approach, a survey-based method for data collection with a total of 155 questionnaires distributed to FMCG firms in Jakarta with 119 usable responses retrieved. The effects of supply chain responsiveness, flexibility, and quality on customer development were analyzed using partial least squares structural equation modeling (SEM-PLS). The result confirmed the positive impact of supply chain responsiveness, flexibility, and quality on customer development. The finding also showed that the operations system responsiveness, supplier network responsiveness, supply chain flexibility, and quality drive the logistics system responsiveness. Additionally, logistics process responsiveness partially mediated the effect of operations system responsiveness, supplier network responsiveness, supply chain flexibility, and supply chain quality on customer development.*

### Keywords:

Supply chain, responsiveness, flexibility, quality, customer development

### 1. Introduction

The impact of globalization has changed the business perspective in recent years causing increased pressure and dynamic competition (Pundir et al, 2019). Globalization demands the ability to adapt to changes in customer demand that always occur (Shaharudin et al, 2018). The existence of dynamic and unstable customer demand makes the firm's supply chain must have the flexibility to meet customer needs. Firms must be able to respond quickly to changes that occur. Supply chain management defines as the integration of process supply and demand, sourcing raw materials and parts, manufacturing & assembly, warehousing & inventory tracking, order entry & order management, distribution, and delivery to the customer. A typical supply chain is described in Figure 1.



Figure 1. Typical Supply Chain

The three main strategies in the supply chain are low cost, high quality, and improved responsiveness (delivery time and flexibility of product delivery). Supply chain performance is an indicator of how well the supply chain fulfills its objectives since it indicates the supply chain's ability to adapt to changing customer needs and lead to elevated

performance (Blome, 2013). Supply chain performance which includes efficiency, flexibility, responsiveness, and quality has a positive impact on customer satisfaction and firm behavior.

Fast-Moving Consumer Goods (FMCG) is an industry that is characterized by goods that are sold frequently, produced at high volume, and low cost (Aljunaidi & Ankrah, 2014). FMCG is typically consumed, bought rapidly, and sold in large quantities at low cost. These products are generally available in a variety of outlets including retail stores, grocery stores, wholesalers, and supermarkets (AMR, 2019). As the products are used daily, have a short shelf life, and the products are bought frequently, the market is very large and competitive. The complexity and pressure in the supply chain can be seen in the FMCG industry where visibility becomes important for firms, with rapid growth over the last decades and the market expected to reach a value of \$ 15,361.8 billion (CAGR of 5.4% from 2018 to 2025) made FMCG industry as one of the important contributors to economic growth (AMR, 2019). In Indonesia, the sales value of the FMCG industry is more than 10 billion US dollars with a positive overall YOY change in the FMCG market value of seven percent in the third quarter of 2022 (Agus Mulyawan et al. (2022), Kantar, (2022)).

The focus of the FMCG industry itself is to create a supply chain that provides for customer needs most effectively and efficiently (Tugande, 2020). The high frequency of FMCG requires the actors within the industry to produce and distribute their goods to their customers daily. The increased and changing demand nowadays puts pressure on the operations of FMCG companies. Delivery time, distribution service level, and product variety are important attributes of a firm from a customer perspective (Chopra & Meindl (2016)). The level of customer value determines the success or failure of any firm. Customer development is defined as the ability of a firm to attract, satisfy, and retain its customers. Thus, one of the important goals for a firm is to develop customer development capabilities (Amedofu et al., (2019)). In the FMCG industry, where tastes and preferences are changing from time to time, achieving customer satisfaction can be aimed by increasing product availability, delivery, innovation, and quality dimensions (Sharma, 2015).

The main purpose of this study is to examine the impact of supply chain responsiveness, supply chain flexibility, and supply chain quality on customer development in the FMCG industry. Moreover, mediating impact of logistics process responsiveness among operations system responsiveness, supplier network responsiveness, supply chain flexibility, and supply chain quality will be examined as well. This research is imperative for businesses to develop operations systems, logistics processes, and supplier networks to respond to the changing taste, preferences, and demands of customers to attract, satisfy, and retain their customers.

## **2. Literature Review**

### **2.1. Supply Chain Performance**

Good supply chain performance is defined as how to get the right products, to the right place, at the right time, and the lowest cost. Eight supply chain performances were identified: quality, customer response, product development cycle time, supply chain integration, supply chain flexibility, supply chain agility, supply performance, and market performance (Thekkooote, 2021).

### **2.2. Supply Chain Responsiveness**

Supply chain responsiveness is described as the promptness and the extent to which the supply chain can meet changing customer needs in relation to their demands as well as responding to other changes in a dynamic business environment (Danese et al., 2013). Supply chain responsiveness is categorized into three categories: operation system, logistics process, and supplier network responsiveness. Operation system responsiveness is a firm's capability to quickly adjust its operations systems to react swiftly to variations in the volume and mix of products demanded by customers. Logistic process responsiveness is defined by the capability of a firm's warehousing system, distribution, and outbound transportation system to meet customer demands. Last, supplier network responsiveness is the capability of a firm's major suppliers to respond and meet customer demands (Thatte et al, (2013), Al-Hawajreh (2014)). The increasing supply chain responsiveness will bring benefits to firms and have a positive impact and lead to elevated in a firm's performance in the long term such as achieving sustainable growth (Rana, (2015)).

### **2.3. Supply Chain Flexibility**

Supply chain flexibility is described as the capability to reconfigure critical facilities to ensure competitiveness. Operations management classifies supply chain flexibility as product flexibility, delivery flexibility, access flexibility,

and responsiveness to the target market (Maaz, 2022). A flexible supply chain can lead to customer satisfaction and inventory minimization (Lummus et al, 2013).

#### 2.4. Supply Chain Quality

Quality is defined as the ability of a product to meet or exceed the expectations and needs of consumers (Aditya, 2020). Quality as supply chain performance measurement is divided into process quality and product quality. Process quality consists of the production system, storage conditions, traceability, marketing processes, and environmental aspects. There are six dimensions of product quality as follow: appearance, shelf-life, sensory properties, reliability, safety and health, and convenience (Maaz, 2022). Product quality has a positive impact on customer satisfaction and product purchase repetition (Hendra (2022).

#### 2.5. Customer Development

Customer development is a firm’s ability to attract, satisfy, and retain customers by providing goods to meet the demands of customers (Amedofu, 2019). Literature research reveals several studies that examine drivers of customer development empirically. The first one is Amedofu et al. (2019) who examined supply chain management practices as drivers of customer development among start-up firms. Their study confirmed the positive impact of supply chain management practices on the firm’s ability to acquire, satisfy, and retain its customers. Meanwhile Asamoah et al (2021), in their study explored operation system responsiveness and supplier network responsiveness as drivers of the logistics system responsiveness of firms. It was found that operation system responsiveness and logistics process responsiveness improved customer development.

**Table 1. Summary of empirical studies examined the driver aspects of customer development.**

Author (year)	Title	Variable	Finding
Asamoah et.al (2021)	The effect of supply chain responsiveness on customer development.	Operations system responsiveness, Supplier network responsiveness, Logistics process responsiveness, Customer development	Operations systems responsiveness and supplier network responsiveness drives the logistics systems responsiveness of firms
Amedofu et.al (2019)	Effect of supply chain management practices on customer development and start-up performance	Customer Relationship, Supplier Relationship, Supply Chain Information Sharing, Supply Chain Information Management, SCM Practices, Customer Development, Start-up Performance	Supply chain management practices had a positive and significant impact on customer development
Mappesona (2020)	Customer Purchase Decision Model, Supply Chain Management and Customer Satisfaction: Product Quality and Promotion Analysis	Product quality, Product performance, Product features, Reliabilities, Conformance, Durability, Serviceability, Aesthetic, Fit and Finish, Promotion, Advertising, Personal sales, Sales promotion, Digital marketing, public relations	Product quality and supply chain management systems have a significant effect on purchasing decisions
Tenreng et.al (2019)	Perceived Service Quality, Supply Chain Collaboration, Supply Chain Management as Antecedents of Loyalty, and Customer Satisfaction: Exploring Moderating Role of WOM	Supply chain management, Supply chain collaboration, Perceived service quality, WOM, Customer satisfaction, Customer loyalty	Supply chain management practices and perceived service quality have an impact on increasing customer satisfaction which will increase customer loyalty.

### 3. Theoretical Framework

This study is guided by two theories: the resource-based view (RBV) theory and the Dynamic Capabilities Theory (DCT). The theoretical framework of the study proposes that supply chain responsiveness, supply chain flexibility, and supply chain quality positively influence customer development.

### 4. Research Model and Hypotheses

A research model is developed to examine the relationship between supply chain responsiveness (operation system responsiveness, logistics process responsiveness, and supplier network responsiveness), supply chain flexibility, supply chain quality, and customer development. It is proposed that the three-supply chain performance (responsiveness, flexibility, and quality) has a direct impact to attract, to satisfy, and to retain customers. The research model is presented in Figure 2.

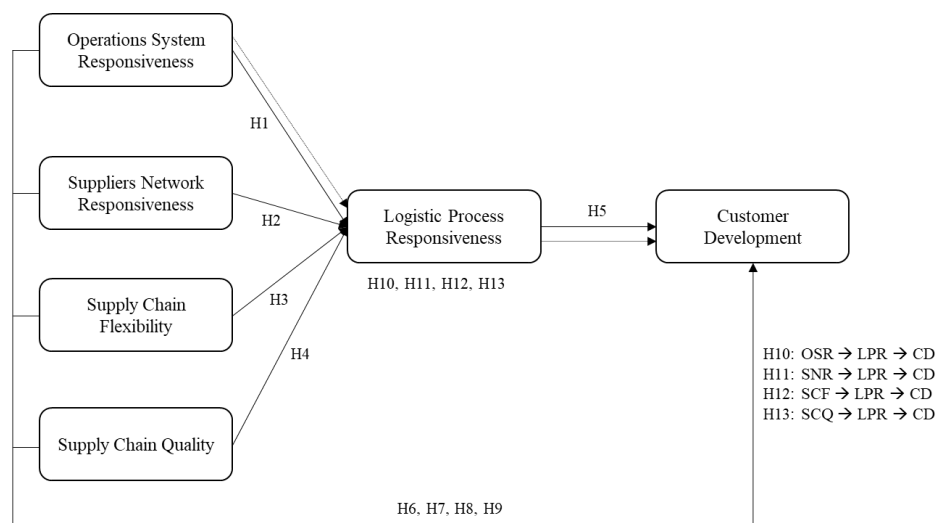


Figure 2. The Conceptual Research Framework

#### 4.1. Relationship between operations system responsiveness with logistics process responsiveness

A firm could deal quickly and effectively with sudden changes in the market if achieving responsiveness in the warehousing, transportation, and distribution processes (Singh et al, 2019). This view is supported by the findings of Qrunfleh and Tarafdar (2013) who observed that flexible and responsive operations systems act as the basis for responsive logistics systems. Therefore, it is hypothesized that:

H1. Operations systems responsiveness has a positive influence on logistics process responsiveness.

#### 4.2. Relationship between supplier network responsiveness with logistics process responsiveness.

The flexibility and the quickness of firms in responding to changes in a dynamic environment depend not only on their internal operating systems but also on how responsive the firm's main suppliers are (Kim et al., 2013). This leads us to hypothesize that:

H2. Supplier network responsiveness has a positive influence on logistics process responsiveness.

#### 4.3. Relationship between supply chain flexibility with logistics process responsiveness

Logistics flexibility is the ability to customize activities such as storage, inventory, transportation, and delivery (Yu, 2017). This view is supported by the findings of Nagarajan (2013) who observed that logistics process responsiveness has a positive impact on supply chain flexibility. Therefore, it is hypothesized that:

H3. Supply chain flexibility has a positive influence on logistics process responsiveness.

#### **4.4. Relationship between supply chain quality with logistics process responsiveness**

Quality has an impact on the firms and their performance, the end effect being that firms will start to inject a quality management approach into their logistics vision (Estampe, 2013). This leads us to hypothesize that:

H4. Supply chain quality has a positive influence on logistics process responsiveness.

#### **4.5. Relationship between logistics process responsiveness with customer development**

Thatte et al (2013) found that logistics process responsiveness is the ability of a firm's warehousing, transportation, and distribution system to quickly respond to changes in customer demand. This leads us to hypothesize that:

H5. Logistics process responsiveness has a positive influence on customer development.

#### **4.6. Relationship between operations systems responsiveness with customer development**

Firms that can quickly vary their product variations, develop new products, or make product modifications based on observed changes in the business environment and customer demand trends will be able to attract more new customers (Lamore et al., 2013). This view is supported by the findings of Saenz et al. (2018) that suggest if the firms can quickly reconfigure their resources to produce goods with varying variety and volumes will have more chance to satisfy and retain their customers. This leads us to hypothesize that:

H6. Operations systems responsiveness has a positive influence on customer development.

#### **4.7. Relationship between supplier network responsiveness with customer development**

Al-Hawajreh and Attiany (2014) found that a more responsive supplier network will create a higher level of competitive advantage for a firm. This leads us to hypothesize that:

H7. Supplier network responsiveness has a positive influence on customer development.

#### **4.8. Relationship between supply chain flexibility with customer development**

Putra (2020) explained that supply chain flexibility affects retailer satisfaction. To increase satisfaction, firms should have the ability to provide products according to customer demands. This leads us to hypothesize that:

H8. Supply chain flexibility has a positive influence on customer development.

#### **4.9. Relationship between supply chain quality with customer development**

According to Mappesona (2020) that product quality has a significant effect on customers' purchasing decisions. In their research, Hendra et al (2022) explained that product quality and price have a significant influence on customer satisfaction, and customer satisfaction has a significant influence on customer loyalty. This leads us to hypothesize that:

H9. Supply chain quality has a positive influence on customer development.

#### **4.10. Relationship between logistics process responsiveness as a mediator between operations systems responsiveness with customer development**

Al-Hawajreh and Attiany (2014) explained that a firm's operations system responsiveness capability will increase its capabilities such as delivery dependability. Therefore, it is hypothesized that:

H10. Logistics process responsiveness mediates the influence of operations systems responsiveness on customer development.

#### **4.11. Relationship between logistics process responsiveness as a mediator between supplier's network responsiveness with customer development**

In their study, Al-Hawajreh and Attiany (2014) found that increasing a firm's network responsiveness will increase its capabilities such as delivery dependability. This leads us to hypothesize that:

H11. Logistics process responsiveness mediates the influence of suppliers' network responsiveness on customer development.

#### **4.12. Relationship between logistics process responsiveness as a mediator between supply chain flexibility with customer development**

According to Soon (2010) firms enhanced their flexibility with logistics networks to be responsive to their customers. One of the core flexibilities of the value chain can be defined from a logistics perspective. This leads us to hypothesize that:

H12. Logistics process responsiveness mediates the influence of supply chain flexibility on customer development.

#### **4.13. Relationship between logistics process responsiveness as a mediator between supply chain quality with customer development**

In their reviews, Siddh et.al (2017) found that logistics and distribution influence Agri-fresh food supply chain quality (AFSCQ). This leads us to hypothesize that:

H13. Logistics process responsiveness mediates the influence of supply chain quality on customer development.

### **5. Research Methodology**

#### **5.1. Measurement items**

The study examined the impacts of operations system responsiveness, logistics process responsiveness, supplier network responsiveness, supply chain flexibility, and supply chain quality on customer development. The indicators items used to measure the operations system, logistics process, and supplier networks responsiveness were adapted from Asamoah (2021), supply chain flexibility was adapted from Putra (2020) and Yu (2017) meanwhile supply chain quality was adapted from Hendra (2022) and Maaz (2022). On other hand, measurement items for customer development were adapted from Asamoah (2021). All items were measured with a 5-point Likert Scale and the measurement items used in the study are presented in the Appendix.

#### **5.2. Data Collection**

For this study, primary data has been collected. Manufacturing firms in Indonesia were the target of the survey. The researchers took into consideration only firms that registered with SIINas. A list of 30.578 firms was generated from the database of registered firms, out of which nine manufacturing FMCG firms are selected for data collection based on market capitalization and the firm was or is the market leader in minimarket across categories. Questionnaires were sent to the employees in selected firms. A total of 119 responses were obtained from the nine firms selected. Adequacy of the number of responses received was established using power analysis (Hair et al, 2018). Within Hair's rule of thumb, the minimum sample size is 100–200 samples, meaning that the 119 responses obtained were sufficient for this study.

#### **5.3. Data Analysis**

##### **5.3.1. Demographic data**

Based on FMCG industry products, it was observed that 51.3% of the respondents were from FMCG-Personal Care products, 20.2% of the respondents came from FMCG-Non-Personal Care products, whilst 28.6% from FMCG-Personal Care & Food products. Based on the department, it was observed that 52.1% of the respondent came from the logistics department, this is caused by the headcount of the logistics department is indeed the highest in manufacturing firms. It also observed that 42.9% of respondents have worked for more than five years, which means that most respondents are experienced, and based on their job title, 51.3% of the respondents are staff, this is due to the structure of a manufacturing company in the form of a pyramid (the lowest layer with the highest number of employees) so that the staff or admin level has the largest population.

##### **5.3.2. Measurement model results**

The method of statistical analysis of the data was selected and adapted to the research objectives. The statistical analysis of the data used in this study using the Structural Equation Modeling (SEM) method and the analysis tool used in this method is the Smart PLS 3.0 (PLS) software. The PLS-SEM analyses are presented by first presenting the results for the measurement model which is followed by comprehensive structural model results. The model analysis was done by performing relevant tests to ensure they meet the appropriate thresholds as recommended (Hair et al., 2019). All indicators are valid and meet the loading factor value  $> 0.5$ , which means that the indicators used in

this study are valid or have met the requirements. Examining the internal consistency of the constructs revealed that all items had composite reliability above 0.6 as recommended. Convergent validity was assessed by examining the AVE and it was observed that AVE values were greater than 0.5, which is indicative of acceptable convergent validity (Hair et al., 2019). Item loadings, composite reliability, and AVE of constructs are presented in Table 2.

**Table 2. Descriptive statistics and psychometric properties of research constructs**

<b>Construct</b>	<b>Items</b>	<b>Loadings</b>	<b>Composite reliability</b>	<b>AVE</b>
Supply Chain Flexibility	FRP1	0.843	0.917	0.649
	FRP2	0.831		
	FRP3	0.787		
	FRP4	0.772		
	FRP5	0.806		
	FRP6	0.791		
Supply Chain Quality	KRP1	0.828	0.885	0.659
	KRP2	0.771		
	KRP3	0.806		
	KRP4	0.840		
Logistics Process Responsiveness	PL1	0.770	0.877	0.588
	PL2	0.694		
	PL3	0.794		
	PL4	0.806		
	PL5	0.766		
Customer Development	PP1	0.800	0.929	0.723
	PP2	0.867		
	PP3	0.879		
	PP4	0.896		
	PP5	0.807		
Operation System Responsiveness	SO1	0.803	0.914	0.639
	SO2	0.803		
	SO3	0.816		
	SO4	0.839		
	SO5	0.800		
	SO6	0.729		
Supplier Network Responsiveness	Sup1	0.857	0.913	0.678
	Sup2	0.821		
	Sup3	0.859		
	Sup4	0.762		
	Sup5	0.816		

### 5.3.3. Structural model results

After assessing the measurement model regarding the validity and reliability of the various constructs, the structural model results were assessed. the customer development construct can be explained by the operating system, supplier, logistics, flexibility, and quality variables of 0.584 or 58.4%, while the remaining 41.6% is explained by other variables

outside the research model. The logistics construct can be explained by 0.597 or 59.7% by operating system variables, suppliers, logistics, flexibility, and quality, while the remaining 40.3% is explained by other variables outside the research model. The R square of constructs is presented in Table 3.

**Table 3. The R square of constructs**

Constructs	R Square
Customer Development	0.584
Logistics	0.597

The path coefficients and the research model were examined to assess the research hypotheses. The results of the hypotheses tests are summarized in table 4. The results of the analysis revealed that nine of the thirteen hypotheses were supported. Operations systems responsiveness, supplier network responsiveness, and supply chain flexibility had positive and significant effects on logistics process responsiveness as hypothesized. Additionally, logistics process responsiveness, supply chain flexibility, and supply chain quality had a direct positive and significant effect on customer development. Regarding the mediating role of logistics process responsiveness, it was observed that logistics process responsiveness mediated the effect of operations systems responsiveness, supplier network responsiveness, and supply chain flexibility on customer development significantly. However, logistics process responsiveness did not significantly mediate the effect of supply chain quality on customer development.

**Table 4. Results of hypothesized relationships**

HS	Hipotesis	O	P Values	Decision
H1	OSR -> LPR	0.401	-	Supported
H2	SNR-> LPR	0.205	0.012	Supported
H3	DCF -> LPR	0.248	0.012	Supported
H4	SCQ -> LPR	0.026	0.367	Not Supported
H5	LPR -> CD	0.264	0.002	Supported
H6	OSR -> CD	0.011	0.461	Not Supported
H7	SNR-> CD	-0.100	0.162	Not Supported
H8	SCF -> CD	0.237	0.026	Supported
H9	SCQ -> CD	0.453	-	Supported
H10	OSR -> LPR -> CD	0.106	0.005	Supported
H11	SNR-> LPR -> CD	0.054	0.035	Supported
H12	SCF -> LPR -> CD	0.065	0.060	Supported
H13	SCQ -> LPR -> CD	0.007	0.374	Not Supported

## 6. Discussion

The study was conducted to empirically explore the concept of supply chain responsiveness, supply chain flexibility, and supply chain quality and to examine how it influences the customer development capabilities of firms. Operation system responsiveness has a positive and significant influence on logistics process responsiveness (OSR coeff. is 0.401, with a p-value is 0.000). This is supported by Ning (2019) who states that flexibility, speed, and agility in the transportation logistics strategy by providing customized products in the warehouse to meet customer demands. Supplier responsiveness has a positive and significant influence on logistics process responsiveness (SNR coeff. is 0.205, with a p-value is 0.012). The results of this study support research that has been conducted by Chu and Wang (2012) that found responsive suppliers thus provide a source of external capabilities that can be integrated into the company to increase the responsiveness of its logistics processes to meet changes in a dynamic environment. Supply



chain flexibility has a positive and significant effect on logistics process responsiveness (SCF coeff is 0.248, with a p-value is 0.012). The results of this study support research that has been conducted by Yu (2016) which states that logistics flexibility is a firm's ability to adjust activities such as warehousing, transportation, and distribution. Supply chain quality has no influence on logistics process responsiveness (SCQ coeff. is 0.026, with a p-value is 0.367). The logistics process responsiveness has a positive and significant influence on customer development (LPR coeff. is 0.264, with a p-value is 0.002). Operation system responsiveness has no influence on customer development (OSR coeff. is 0.011, with a p-value is 0.461). Supplier network responsiveness has no influence on customer development (SNR coeff. is -0.01, with a p-value is 0.162). The previous hypothesis said that operation system responsiveness and supplier network responsiveness do not directly influence customer development, however, the process logistics responsiveness has direct effects on customer development. This means that even though the firm has a responsive operation system and suppliers. if the firm does not have responsive logistics, the product will not arrive quickly and precisely at the customer, which will ultimately affect the company's ability to attract, satisfy and retain customers. Supply chain flexibility has a positive and significant impact on customer development (SCF coeff. is 0.237, with a p-value is 0.026). The results of this research support the results of research conducted by Putra (2020) previously that supply chain flexibility affects retailer satisfaction. To increase satisfaction, flexibility in the supply chain is needed, namely having the ability to provide products according to customer demands. Supply chain quality has a positive and significant influence on customer development (SCQ coeff. is 0.237, with a p-value is 0.026). The results of this study support the results of research conducted by Mappesona (2020) which states that product quality has a significant effect on purchasing decisions.

The logistics process responsiveness mediates a positive relationship between operation system responsiveness and customer development. The results of this study support research conducted by Saenz (2018) which states that a firm's operating system is basically responsible for producing the volume and mix of products requested by customers, and delivered to customers in a timely, reliable, safe, and efficient manner. cost-effective to delight customers. The logistics process responsiveness mediates a positive relationship between supplier network responsiveness and customer development. These results support the results of research conducted by Chavez (2017) which state that suppliers who are less responsive and inefficient tend to thwart the flow of goods through the supply chain to customers, which causes poor delivery performance and poor-quality customer service. The logistics process responsiveness mediates a positive relationship between supply chain flexibility and customer development. These results support the results of previous research by Hartmann (2011) which stated that the flexibility of logistics service providers is a strong driver of all core dimensions of customer loyalty. For last, the logistics process responsiveness cannot mediate supply chain quality to customer development.

## 7. Implications of the study

The study provides insights that can guide managers seeking to maximize the supply chain responsiveness, supply chain flexibility, and supply chain quality capabilities of their firms, as well as the capability of their firms to attract, satisfy and retain customers. First, managers should put the greatest effort into enhancing the responsiveness of their logistics process as this has the greatest effect on customer development. Managers should explore avenues for increasing the ability of their logistics systems as well as enhancing their transportation, distribution, and warehousing systems. Second, managers should put the effort into enhancing the flexibility and the quality of their supply chain system as this has a direct effect on customer development. Having an operating system that can quickly produce various product types and sizes and new products, as well as being supported by a logistics process that quickly delivers can improve customer development. In addition, improving the quality of the supply chain is also necessary for customer development. Firms must ensure that the products they manufacture and distribute are of high quality, attractive and innovative to attract, satisfy and retain their customers.

## 8. Limitations and future research directions

There are some limitations of the study. This study only discusses three dimensions of supply chain performance (responsiveness, flexibility, and supply chain quality). This research also only specifically addresses the three dimensions of supply chain responsiveness. Data collection is limited to FMCG firms operating in Indonesia, so it is possible that the relevant situation occurring in FMCG does not reflect in another sector. Future studies can also delve deeper into the other supply chain variables so that they can complement all aspects of supply chain

performance toward customer development. Future researchers are expected to be able to specifically discuss the dimensions of supply chain flexibility and quality so that other potential variables that can affect customer development can be identified. Future researchers are expected to be able to examine other industrial sectors so that comparisons between industrial sectors can be carried out.

## References

- Al-Hawajreh, K.M. and Attiany, M.S. 2014. The effect of supply chain responsiveness on competitive advantage: a field study of manufacturing companies in Jordan. *European Journal of Business and Management*, Vol. 6 No. 13, pp. 151-162.
- Asamoah, David, et.al. 2021. The effect of supply chain responsiveness on customer development. *The International Journal of Logistics Management* Vol. 32 No. 4, pp. 1190-1213.
- Blome, C., Schoenherr, T. and Eckstein, D. 2014. "The impact of knowledge transfer and complexity on supply chain flexibility: a knowledge-based view", *International Journal of Production Economics*, Vol. 147, pp. 307-316.
- Danese, P., Romano, P. and Formentini, M. 2013. "The impact of supply chain integration on responsiveness: the moderating effect of using an international supplier network", *Transportation Research Part E: Logistics and Transportation Review*, Vol. 49 No. 1, pp. 125-140
- Hendra, Saiful, et.al. 2022. Analysis of the Effect of Quality and Price on Consumer Satisfaction and Their Impact on Consumer Loyalty. *JIME (Journal of Industrial and Manufacture Engineering)*. 6(1):64-74.
- Kim, W., Kim, H., & Hwang, J. 2020. Sustainable growth for the self-employed in the retail industry based on customer equity, customer satisfaction, and loyalty. *Journal of Retailing and Consumer Services*, 53, 101963.
- Maaz, M.A.A., Ahmad, Rais. 2022. Impact of supply chain performance on organizational performance mediated by customer satisfaction: a study of dairy industry. *Benchmarking: An International Journal*, 28(1): 1-22.
- Mappesona, Henry. 2020. Customer Purchase Decision Model, Supply Chain Management and Customer Satisfaction: Product Quality and Promotion Analysis. *International Journal of Supply Chain Management*, Vol. 9, No. 1 : 592-599.
- Rana, S.M.S., et.al. 2015. Determinants of Supply Chain Performance: A Strategic Point of View. *International Journal of Supply Chain Management*, Vol. 4, No. 3: 94:92.
- Pundir, A. K., Jagannath, J. D., & Ganapathy, L. 2019. Improving supply chain visibility using iot-internet of things. In 2019 IEEE 9th annual computing and communication workshop and conference (ccwc), pp. 156–162.
- Shaharudin, M. R., Rashid, N. R. N. A., Wangbenmad, C., Hotrawaisaya, C., and Wararatchai, P. 2018. A Content Analysis of Current Issues in Supply Chain Management, *International Journal of Supply Chain Management*, 7(5), 199-212.
- Singh, R.K., Kumar, P. and Chand, M. 2019, "Evaluation of supply chain coordination index in context to Industry 4.0 environment", *Benchmarking: An International Journal*, Vol. 28 No. 5, pp. 1622-1637
- Tenreng, Mariana., Idrus, Arifin., Lalo, Annas., Badruddin, Syamsiah., Perceived Service quality, Supply Chain Collaboration, Supply Chain management as Antecedents of Loyalty and Customer Satisfaction: Exploring Moderating Role of WOM. *International Journal of Supply Chain Management*, Vol.8, No.6, 412-418.
- Thatte, A.A., Rao, S.S. and Ragu-Nathan, T.S. 2013. "Impact of SCM practices of a firm on supply chain responsiveness and competitive advantage of a firm", *Journal of Applied Business Research*, Vol. 29 No. 2, pp. 499-530.
- Thekkoote, Ramadas. 2021. Understanding big data-driven supply chain and performance measures for customer satisfaction. *Benchmarking: An International Journal*, 29(8): 2359-2377.

## Appendix

Measurement items

Operations system responsiveness

OSR1: Respond quickly to changes in product volume demanded by customers.

OSR2: Respond quickly to changes in the type of product requested by customers.

OSR3: Effectively speed up customer emergency orders.

OSR4: Reconfigure equipment to quickly cope with changing demands.

OSR5: Reconfigure personnel to quickly cope with changing requests.

OSR6: Modify processes to quickly address changing requests.

Logistics process responsiveness

LPR1: Respond quickly to unexpected changes in shipping requests.

LPR2: Adjust warehouse capacity to quickly cope with changes in demand.

LPR3: Varying transport carriers to quickly cope with changing demand.

LPR4: Accommodate special or non-routine customer requests quickly.

LPR5: Can shorten the delivery lead time if needed.

Supplier network responsiveness

SNR1: Can change production volume in a relatively short time according to demand.

SNR2: Can change production variations in a relatively short time according to demand.

SNR3: Can quickly change capacities to meet our changing needs.

SNR4: Always deliver orders on time.

SNR5: Effectively expedite emergency orders.

Supply Chain Flexibility

SCF1: Can manufacture products in various sizes according to customer demands.

SCF2: Can manufacture various types of products according to customer demands.

SCF3: Can produce new products and introduce them to customers quickly.

SCF4: Can improve product quality quickly if there is a defect (damage) and complaints or feedback from customers.

SCF5: Can shorten the delivery lead time if needed.

SCF6: Can deliver orders to new destination points quickly.

Supply Chain Quality

SCQ1: Have interesting and innovative products.

SCQ2: Has a wide selection of products to offer.

SCQ3: Have information about the shelf life or expiry date of the product.

SCQ4: Has a certificate of quality management/Good Manufacturing Process (GMP)/Zero Accidents.

Customer Development

CD1: Our firm can attract new customers.

CD2: Our firm has discovered our niche customer.

CD3: Our firm has a validated customer base.

CD4: Our firm can acquire customers.

CD5: Our firm can retain customers.

CD6: Our firm has a growing referred customer base.