THE IMPACT OF SUPPLY CHAIN COLLABORATION IN LOGISTIC SERVICE FOR SME

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ABSTRACT

Fierce competition in the manufacturing field leads many manufacturing companies to shift their way of work. This shift was done by implementing supply chain management practice. The companies collaborate by implementing supply chain collaboration with 3PL, including collaboration between SMEs and 3PL where both parties share the benefits and risks. This study aims to examine the impact of supply chain collaboration on customer satisfaction through logistic services. The data were collected from SMEs engaged as 3PL partners in East Java region with a total of 75 SMEs. The questionnaires were distributed on 60 SMEs in which further proceeded by 42 SMEs with a response rate of 70%. PLS (Partial Least Square) was used to process the data with the following results: First, supply chain collaboration influence service quality relational logistics at 0.790; Second, supply chain collaboration did not have a significant impact on operational logistics service quality; Third, relational logistics service quality had a significant impact on operational logistics service quality at 0.466 and customer satisfaction at 0.197; Fourth, operational logistics service quality had an impact of 0.600 on customer satisfaction.

Keywords: *Supply Chain Collaboration, Logistics Service Quality, Customer Satisfaction*

INTRODUCTION

Today's business environment is very competitive. Thus, many companies look for opportunities outside the organization to collaborate with partners to ensure that their supply chain is efficient and responsive to dynamic market needs. Many companies are aware that this collaboration is needed with the aim of achieving mutual benefits greater than what the company will achieve individually (Cao, Nathan, Vonderembse & Zhang, 2010). In a series of processes from end to end in the supply chain, it is very possible to establish a form of collaboration.

A commonly carried out collaboration is a collaboration between companies and companies that provide logistical support service known as *Third Party Logistic* (3PL). This collaboration aims to enable companies to focus on the main industries they work on. Collaboration with logistic service providers makes the company service users feel calm about the risk of failure of logistics transactions because they have been handled by a service provider company. This kind of collaboration can also reduce substantial investment costs for logic related matters in order to increase the main business development capital. In addition, collaboration can increase the flexibility to reach markets where companies will be free to develop their markets and to realize economies of scale (Suwastika, 2017). Based on the findings in the study conducted by Georgia Tech. (2010), good collaboration with 3PL will make the company able to reduce 15% of logistics costs, fixed asset investment in logistic by 25% and inventory costs by 11%.

Charvet, Leuschner, and Rogers (2013) revealed that logistics service quality has a significant relationship with company performance where service quality logistics can be a source of competitive advantage. Supply chain collaboration will affect relational quality in the context of the logistics service industry (Chen, Chou & Kuo, 2017). Efficient relationship logistics is influenced by joint decision making and information sharing between supply chain (Cho, Ha & Park, 2011). On the other hand, collaboration shows significant positive relationships with the level of time-based logistical service quality (*timeliness*) (Adams, Dalela & Richey, 2012). In order to achieve operational logistic effects, supply chain collaboration is needed (Daugherty, Keller & Stank, 2001). The level of logistics services provided by the company then determines customer satisfaction (Thai, 2013).

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Supply chain collaboration with 3PL has been carried out by many Small and Medium Enterprises (SMEs). Chain collaboration supply enables SMEs to work together and compete in the market to attract customer attention and market share at the same time. Wagner, Fillis, and Johansson (2003) found something unique in SMEs that SMEs tend to have strong ties with partners in an informal form. SMEs that have inter-partnership relationships with other actors in the supply chain have a significant growth rate compared to those who do not (Pooran & Watson, 2005). However, basically SMEs are still considered limited in several things related to the implementation of its supply chain management namely inefficient inventory management (39%), lack of attention to uncertainty (30%), valuing improper inventory costs (26%), lack of communication and inaccurate data (Rahman, 2012). Further, one of the keys to the success of SMEs is to build information sharing with suppliers and build logistics capabilities (Sharma, 2011; Hamister, 2011; Zulkifli, 2010).

LITERATURE REVIEW AND HYPOTHESIS

Supply Chain Collaboration

Supply chain collaboration is defined as two or more chain members working together to create competitive advantage through sharing information, making joint decisions, and sharing benefits from profitability that is greater than satisfying end customer needs rather than acting alone (Mathuramaytha, 2011). Supply chain collaboration can only be understood as a decision-making process between parties interdependent at many levels in the supply chain that involves joint ownership of decisions and collective responsibility for results (Cao, Fynes, Humphreys, McKittrick & Wiengarten, 2010). According to Sima-tupang and Sridharan, (2005), supply chain collaboration can be measured by indicators of information sharing, decision synchronization, and incentive alignment.

Logistic Service Quality

Logistic service quality is an instrument used for measuring the perception of suppliers to value created for them by logistics services (Jang, Marlow & Mitroussi, 2013). Logistics service quality is defined as a collection of performance factors and is measured by the ability to distribute products according to customer requirements (Liu, Miao, Wang & Yang, 2016). Logistic service itself is divided into operational logistics service quality and relational logistics services quality.

Operational logistics service quality (OLSQ) is the perception of logistical activities carried out by service providers that contribute to the quality, productivity, and consistent efficiency (Davis-Sramek, Mentzer, & Stank 2008). In addition, operational service quality logistics is defined as the business operational delivery activities including physical features of services and perceived reliability, for example, to perform the promised services reliably and accurate (Capatina, Olfa & Rym, 2013). Operational logistics service quality according to Li, Shi & Yuan (2014) are information quality, timeliness, accuracy, error processing convenience, and reliability.

Relational logistics service quality (RLSQ) is defined as a perception of logical activities that bring the company closer to its customers where the company will try to understand the needs and expectations of customers and develop a process for its customers (Davis-Sramek, Mentzer, & Stank 2008). The indicator of relational logistics service quality is focused on perceptions (Capatina, Olfa & Rym, 2013) such as assurance, responsiveness, and caring.

Customer Satisfaction

Customer satisfaction is a customers' state of mind about the company when their expectation on the product or service are met or exceeded (Otsetova, 2017). Achievement of customer satisfaction is implemented can lead to corporate loyalty and repurchase (Otsetova, 2017). Satisfied customers are good sources of increasing profitability. This is because satisfied consumers tend to be committed to better service and social organization services with service providers. On the contrary, dissatisfied companies complain more and rescue to buy back (Kim, Ko, Lee & Sagas, 2011). According to Homburg and Garbe

(in Williams, Ashill, Naumann, & Jackson, 2015), the customer satisfaction indicators can be measured in terms of structural quality, process quality, and outcome quality.

RESEARCH METHOD

This study was a causality study focused on finding explanations in the form of causal relationship between several variables developed in management. The population in this study was 75 SME logistic service users. The sampling technique used was purposive sampling based on criteria set ahead namely samples taken based on the availability of information. Based on these criteria, the number of samples collected was 42 SMEs spread across Surabaya, Jember, Kediri, Madiun, Malang, Mojokerto, and Tulung Agung. Furthermore, this study used a relationship model to test existing hypotheses and used the Partial Least Square (PLS) technique to analyze the data.

FINDINGS AND DISCUSSION

In this study, data analysis included evaluating the outer and inner model. The results of the data analysis show that all measurement indicators of research variables consist of supply chain collaboration, operational logistic service quality, relational logistic service quality, and customer satisfaction were valid. This is indicated by the coefficient of outer loading and cross loading which ranges from 0.709-0.928. It can be seen from the Cronbach Alpha coefficient showing values equal to 0.895-0.9951 while composite reliability shows a value equal to 0.935-0.957. Based on the results of this analysis, indicators and research variables can be considered as valid and reliable. Coefficients (R2) are presented in Table 1.

Table 1. *R-Square*

Variable	R *Square*
Customer Satisfaction (Y)	0,582
Operational LSQ (Z1)	0,659
Relational LSQ (Z2)	0,624

Based on Table 1, it can be explained that the coefficient of OLSQ and RLSQ determination on customer satisfaction was 0.852. This illustrates that 58.2% of customer satisfaction was influenced by OLSQ and RLSQ while the rest were other factors outside the research element. Meanwhile, OLSQ and RLSQ were influenced by supply chain collaboration by 65.9% and 62.4%, the rest (34.1% and 37.6%) were other factors outside this study. Furthermore, the results of calculating the Q-Square value are as follows: 0,8784. It shows that the diversity of the research data explained by the research model was 97.84% while the remaining (12.16%) was explained by other factors outside the model. This research model can be considered to be good or relevant because it had good goodness of fit.

Table 2 Hypotesis Test

	Original Sample	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values
SCC (X1) -> RLSQ (Z2)	0,790	0,801	0,054	14,685	0,000
RLSQ (Z2) -> CS (Y)	0,197	0,199	0,194	1,014	0,311
SCC (X1) -> OLSQ (Z1)	0,391	0,410	0,243	1,610	0,107
OLSQ (Z1) -> CS (Y)	0,600	0,598	0,180	3,328	0,001
RLSQ (Z2) -> OLSQ (Z1)	0,466	0,451	0,234	1,993	0,046
SCC (X1) -> OLSQ (Z1) -> CS (Y)	0,235	0,234	0,152	1,545	0,122
SCC (X1) -> RLSQ (Z2) -> OLSQ (Z1) -> CS (Y)	0,221	0,224	0,156	1,419	0,156
SCC (X1) -> RLSQ (Z2) -> CS (Y)	0,156	0,159	0,153	1,016	0,310
SCC (X1) -> RLSQ (Z2) -> OLSQ (Z1)	0,369	0,359	0,186	1,976	0,048

Table 2 above presents the results of the hypothesis test that the effect of supply chain collaboration on the relational logistics service quality was indicated by p-values 0.000>0.05. This means that supply chain collaboration had a significant impact on the relational logistics service quality. The 3PL company in East Java was able to synchronize data between relevant departments within the company as well as between

SMEs and 3PL as the providers. In addition to the company's ability in synchronizing the data, it turns out that SMEs and 3PL were also able to share information to support customer satisfaction. This finding supports previous studies conducted by Cho, Ha and Park (2011) as well as Chen, Chou and Kuo (2017).

Second, the results of the supply chain collaboration effect on logistics operation service quality above indicate that is rejected. The effect of supply chain collaboration on logistics operations service quality is shown by p-values $0.107 > 0.05$. This shows that supply chain collaboration was not able to influence the operational logistics service quality due to information sharing between SMEs and 3PL which was not on time. In this case, sometimes SMEs have to coordinate with the 3PL company by phone. This condition also occurs due to the existence of inaccurate information or data, especially the barcode data available to companies cannot be read by the information technology system used by a 3PL company which required manual entry.

Third, the test results of the relational logistics service quality effect on service quality operational logistics show that is accepted. This means that the higher relational logistics service quality, the more significant improvement made by the operational logistics service quality by 3PL in East Java. The results of the study show that there were delays in logistical services for several times. However, since the 3PL was doing a responsive service to the SMEs and caring on the inconsistencies in the data, the relationship between the two has a positive and significant impact. The existing error processing can be overcome by the 3PL by providing excellent service. This supported by previous researches conducted by Flint, Hult, and Mentzer (2001) as well as Goldsby, Stank and Vickery (1999).

Fourth, the influence of relational logistics service quality on customer satisfaction is indicated by p-values $0.311 > 0.05$. This means that relational logistics service quality built did not affect customer satisfaction. Based on the results above, it is found that assurance, responsiveness, and caring were not able to satisfy the customers. Those need to be provided for SMEs by the 3PL especially on the assurance provided. Actually, the 3PL has provided responsiveness and caring. However, there is a need for policies to be taken by 3PL as a provider to provide assurance of damaged products and products that are late in delivery. In addition, 3PL has to provide certainty for customers to make claims for 3PL.

Fifth, the test results of the effect of operational logistic service quality on customer satisfaction are indicated by $0.001 > 0.05$ p-values. This means that operational logistics service quality chose a significant impact on customer satisfaction. The results of operational logistic services quality with information quality, timeliness, accuracy, convenience error processing, and reliability as the indicators have an impact on customer satisfaction. Operational ability of 3PL in maintaining products in order not to get error processing and its ability to ensure service reliability will enable SMEs to provide qualified products. This finding supports previous studies conducted by Goldsby, Savitskie, Stank and Vickery (1999) as well as Daugherty, Stand and Ellinger (1998).

The first indirect impact was the effect of supply chain collaboration on customer satisfaction through operational logistics service quality which was indicated by $0.122 > 0.05$ p-values. This means that supply chain collaboration cannot mediate the effect of supply chain collaboration on customer satisfaction through operational logistics service quality. The impact of supply chain collaboration on customer satisfaction through the operational logistics service quality of 0.235 was not significant. The ability of 3PL and SMEs to synchronize data and share information did not have any impact on improving product service quality through responsiveness and caring for the customers. This condition is the same as indirect effect supply chain collaboration on customer satisfaction through relational logistics service quality and operational logistics service quality was at 1.419. This result indicates that relational logistics service quality and operational logistics service quality cannot mediate the influence of collections on customer satisfaction.

Indirect effect supply chain collaboration on customer satisfaction through relational logistics service quality was 1.016. This indicates that relational logistics service quality cannot mediate the influence of collections on customer satisfaction. Relational logistics service quality was able to facilitate the influence of the supply chain collaboration on service quality operational logistics. The higher supply chain collaborator between 3PL and SMEs will increase the relational logistics service quality. In turn, it will improve operational logistics service quality.

CONCLUSION

Collaboration is important in a supply chain. Previous studies show that companies that adopt supply chain collaboration have several benefits such as improving product quality, reducing costs, good risk management, reducing inventory levels, and improving customer service. This study proves that supply chain collaboration affects the quality of logistics services from 3PL relations. 3PLs that collaborate in exchanging information about the delivery schedule and selling process improved the quality of their relationship with SMEs in providing logistics services. Furthermore, good service and having knowledge of ordering products can affect the amount, accuracy, and condition of the order. This is supported by the previous study carried out by Flint, Hult and Mentzer (2001) where a relational component in the ordering measured through personnel contact quality was proven to positively influence the operational elements (timeliness, order accuracy, and order condition). Other findings made by Goldsby, Stank and Vickery (1999) present empirical evidence that relational service quality is an antecedent of operational service. On the other hand, higher operational logistics service quality will significantly improve customer satisfaction. Delivering products on time as promised is the result of quality services from the operational logistics service provided by 3PL. Previous logistical studies concluded that operational and relational performance relative to logistics services had a significant positive effect on customer satisfaction (Daugherty, Ellinger, & Stand, 1998). Thus, 3PL has to pay attention to the quality of its logistics services to meet customer desires and exceed their expectations. Customer expectations that have been exceeded will lead to high performance of 3PL. This study only uses one 3PL with SMEs at its customer. Thus, in the future, this study needs to be continued by adding the number of 3PL as the subject being observed because it will increase the number of respondents as the study sample.

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PRIMARY SOURCES

1	Shu-Hsien Liao, Da-Chian Hu, Li-Wen Ding. "Assessing the influence of supply chain collaboration value innovation, supply chain capability and competitive advantage in Taiwan's networking communication industry", International Journal of Production Economics, 2017 Publication	**2**%
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