

# The Role of Sensing Capability in Improving Financial Performance of Logistics Service Firms

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Most Indonesian Logistics Service Firms have poor financial performance. One of reasons is their weak sensing capability. This research intends to examine the effect of sensing capability (SC) on how logistics service firms-financial performance (LSF-FP) pass through innovative logistics services (ILS). This research used a quantitative method. Data was collected using questionnaires and probability sampling. The sample size consisted of 150 respondents from logistics service firms (LSF) registered as members of Association (ILFA) in the Jakarta (Jabodetabek) region. Unit of observation was constituted by leaders (managers or directors) of the firms. The collected data was analysed by using the SEM-PLS program. This research found that SC had importance role on ILS and financial performance of LSF-FP in Indonesia. In term of implementation, SC must be able to ILS in order to have a more significant impact on their financial performance of LSF-FP.

**Key words:** *Sensing Capability, Innovative Logistics Services, Financial Performance, Logistics Service Firm.*

## Introduction

Rapid technology and market changes have made it more difficult for companies to predict future business development. New information and knowledge will be a source of innovation. In connection with that, companies need to explore opportunities in technologies and markets (Zhou, et al., 2017). In this context, sensing capability is fundamental for dealing with the situation.



Sensing capability is not only an element of dynamic capabilities (Teece, 2017), but is also the most significant element (Froehlich, Bitencourt, and Bossle, 2017). Existing research shows that inconsistencies influence the sensing capability on a firm's (logistics service) performance. Sensing capability has a positive effect on firm (organization) performance (Kihara, Ngugi, and Ogallah, 2016). It should be mediated by innovation (technological innovation) in order to have an effect on financial performance (Zhou et al., 2017). However, according to Lindblom et al. (2008), sensing capability has an insignificant effect on firm performance. The stronger the sensing capability, the higher the technological innovations in the company (Zhou et al., 2017).

Logistics service companies in Indonesia need innovative services to enhance their performance, particularly in financial performance. They mostly (about 80%) constitute small and medium enterprises (SME). The major problem of SME is innovation (to increase productivity) (North and Varvakis, 2016). Therefore, sensing capability is an important ability that must be developed by them. This study intends to examine the effect of sensing capability on how a company's (logistics service firms) performance passes through innovative logistics services both directly and indirectly.

## Literature Review

Capabilities refer to a corporation's skills and abilities to exploit its resources (Wheelen et al., 2018; Robbins and Coulter, 2016). They encompass business processes and daily activities that coordinate and oversee the utilization of resources to transform inputs into outputs. When the capabilities are constantly being modified and reconfigured to make them more adaptive in facing uncertain environments, they are named dynamic capabilities (Wheelen et al., 2018). Dynamic capabilities assist to combine and transform (static) resources into innovative services (Makkonen et al., 2014). According to Teece (2017), dynamic capabilities encompass sensing, seizing, and transforming capabilities. Sensing capability is constituted by a company's practises in identifying, developing and assessing opportunities related to customer needs. Seizing capability refers to how resources are mobilized towards addressing needs and opportunities, and capturing value. Transforming capability refers to how resources are changed or reconfigured in order to sustain a new or different value.

'Sensing' constitute gathering relevant market information (Teece, 2017). Sensing capability is important for companies to be able to analyse the business environment, recognize customer choices, and incorporate employee ideas. Market trends and customer orientation assist companies to recognize customer needs and wants. The ability to identify changes in customer choices is important for companies, especially for service companies. Managers or employees who interact directly with customers must have the knowledge, expertise, and experience to recognize opportunities, and take appropriate action in response. In terms of service innovation,



sensing capability is concerned with understanding the need for changes in existing operations or in opportunities for new service development (Zitkiene, Kazlauskiene, Deksnys, 2015). Sensing capabilities encompass the generation of market intelligence, the dissemination of market intelligence, and the responsiveness to market intelligence (Pavlou and El Sawy, 2011; Teece, 2017). Sensing capability impacts the innovation of product and services (Kodama, 2018).

Innovation is the practical implementation of idea generation, technology development, manufacturing and marketing of a new product and/or services (Trout, 2017; Schilling, 2017; Ottoson, 2019). Innovation is the key element for company sustainability (Kodama, 2018; Ottoson, 2019; Schilling, 2017; Trout, 2017). It could also be a mediating variable in the effect of dynamic capacities on firm performance (Zhou et al., 2017). The types of innovation encompass product, process, position, paradigm, organization, management, production, marketing, and service (Bessant and Tidd, 2015; Schilling, 2017; Trout, 2017). Product innovation refers to activities in the development of new or existing product. Process innovation refers to improvements in the creation and delivery of products or services. Position innovation refers to improvements in the positioning of products or services. Paradigm innovations are improvements in the mindset of business orientation (e.g. conventional or services mindset). Organizational innovation refers to improvements in a company's procedures and standards in all functions (marketing, operation or production, finance and accounting, communications, research and development, human resources, etc.) or divisions. Marketing innovation includes new financing arrangements or new approaches in sales. Service innovation refers to internet-based financial services (Bessant and Tidd, 2013; Schilling, 2017; Trout, 2017).

Firm performance encompasses the effectiveness and efficiency of all of a company's activities (Bititci, 2015). Effectiveness relates to the extent of the output in meeting our expectations, requirements, or specifications, while efficiency relates to the amount of resources used in delivering the output. According to Keller and Price (2011), firm performance relates to all financial and operational aspects assessed by stakeholders. Firm performance is the end result of activities, actual outcomes of a strategic management process (Wheelen et al., 2018). Firm performance is multidimensional, meaning that there are many different kinds of behaviours that have the ability to achieve organizational goals (Aguinis, 2014). Financial performance is used by companies frequently (Bititci, 2015; Keller and Price, 2011) with profitability and growth as its main dimensions (Lindblom et al., 2008; Zhou et al., 2017).

## **Research Method**

This study is constituted by causal or quantitative research. The analysis unit was the organization, and the observation unit was the company's leader (manager or director). Data

was collected using questionnaires (Likert scale) and probability sampling (simple random sampling). The sample size consisted of 150 respondents from logistics service companies registered as members of Association (ILFA) in the Jakarta region. The data were processed using the SEM-PLS program.

The research consisted of three latent variables: Sensing Capability (SC), Innovative Logistics Services (ILS), and Financial Performance of Logistics Service Firms (LSF-FP). The sensing capability consists of four indicators: one, ability in exploring customer's logistics requirement (A1); two, ability in analysing customer's product characteristics (A2); three, ability in analysing customer's logistics operation pattern (A3); and four, ability in analysing market trends (A4). The innovative logistics service consists of three indicators: product (B1), process (B2), services (B3). Financial performance of logistics service firms consist of three indicators: profitability (C1), growth (C2), liquidity (C3). The hypotheses of this research are as follows:

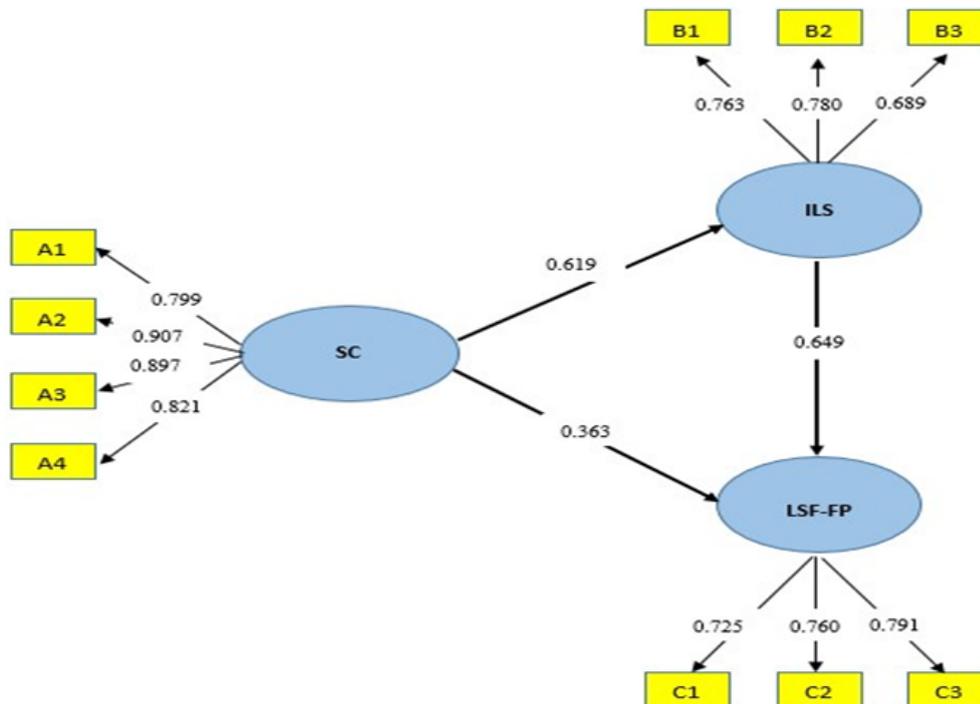
- H<sub>1</sub> : Sensing Capability (SC) has an effect on Innovative Logistics Services (ILS)
- H<sub>2</sub> : Innovative Logistics Service (ILS) has an effect on Financial Performance (LSF-FP)
- H<sub>3</sub> : Sensing Capability (SC) has an effect on Financial Performance (LSF-FP)
- H<sub>4</sub> : Innovative Logistics Services (ILS) mediates the effect of Sensing Capability (SC) on Financial Performance (LSF-FP)

## Results and Discussion

Based on validity and reliability tests, the data had good validity and reliability. The results of the outer model test are that the model had good convergent and discriminant validity. It also showed that all indicators were valid as its construct measures. Besides validity, the model had good composite reliability and average variance extracted (AVE), which demonstrated that the model had good internal consistency. The model also had good Cronbach's Alpha index, once again demonstrating that the model has good reliability. The results of the structural model test (inner model) showed that variation of financial performance construct could be explained by sensing capability and innovative logistics services by 53.6% and the rest (46.4%) was explained by other variables.

The results of hypotheses tests showed that one, sensing capability (SC) has a positive and significant effect on innovative logistics services (ILS); two, that innovative logistics services (ILS) has positive and significant effect on financial performance (LSF-FP); and three, that sensing capability (SC) has positive and significant effect on financial performance (LSF-FP). Innovative logistics service (ILS) significantly mediated the effect of sensing capability (SC) on financial performance (LSF-FP). However, it constitutes a partial mediation because its direct effect had significant effect. The effect coefficients among the latent variables are shown in Figure 1.

**Figure 1.** PLS Model (Algorithm)



The theoretical implications of the research relate to the way in which sensing capability mediated the effect of Sensing Capability (SC) on Financial Performance (LSF-FP). The results of the current study aligned with previous research, which showed that sensing capability (SC) had a positive and significant indirect effect on financial performance through technological innovations (Zhou et al., 2017). The results also aligned with Kodama (2018), who stated that sensing capability had an impact on innovative product and services. According to Tseng and Lee (2014) that dynamic capability will able to enhance organizational performance and provide competitive advantage. Resources must be developed into dynamic capabilities (sensing capability as one of dynamic capabilities) in order to achieve a sustainable competitive advantage (Hasegan, Nudurupati and Childe, 2018). Alford and Duan (2018) stated that dynamic capabilities are key factors that influence a firm's collaborative innovation. The results of current research, however, differ from Lindblom et al. (2008). Innovative logistics services (ILS) was not the only mediating variable in enhancing the financial performance of logistics service companies in Indonesia. There were also some other mediating variables for the effect of sensing capability on financial performance.

The managerial implications showed that the logistics service companies in Indonesia should develop their Sensing Capability, particularly their analysis of customers' product characteristics, in order to encourage innovation in logistics services development. Usually, each product has its own characteristics in its logistics activities, so logistics service providers

must first know what kind of goods or cargoes will be handled in its logistics activities. In general, the higher the logistics risk, the higher the logistics cost; the higher the value or price of the product, the higher the logistics cost; the more nonstandard the products measurement (over dimensions) the higher the logistics cost, and vice versa. Following this, the logistics costs of project goods or cargoes (over dimensions), for example, will be more expensive than fast moving consumer goods (FMCG), and the logistics costs of dangerous goods (explosive, flammable, etc.) will be more expensive than general goods (electronics, textiles, etc.).

Another important aspect in the development of innovative logistics services is an understanding of the customer's patterns of logistics operations. Greater understanding of the pattern of logistics operations increases the innovative logistics services that can be offered. It therefore follows that the higher the quality of service and the more loyal the customer will ultimately be. These capabilities may be developed by logistics service companies through experience or preliminary surveys. The more variations in logistics activities that have been handled by logistics service companies (product variations, regions or countries, modes, terms of transport, etc.), the higher their innovative logistics services capabilities. The more comprehensive the preliminary survey conducted by logistics service companies are, the more innovative the logistics service offered by the company can be. For example, logistics service companies that better understand the conditions of access to project sites will be more likely to propose more innovative logistics operations patterns to their customers.

Customers' logistics service requirements vary. The logistics service firms, therefore, have to offer their logistics services according to the customer's requirements (logistics solutions). These requirements include the scope of logistics services, delivery time, loading-unloading time and technique, minimum volume of shipment, temperature, handling, storage, vehicle quality, etc.). For example, a customer's logistics service requirements may consist of door to door shipment, 10 days in delivery time, loading time 07 AM - 10 AM, unloading time 9 PM-11 PM, loading-unloading by forklifts, minimum volume 50 CBM per shipment, temperature during shipment  $0^{\circ} - (-5)^{\circ} C$ , vertical positioning of goods during shipment, pallet usage during in storage, and a 5 year (max) age limit of vehicles.

By strengthening Sensing Capability, innovative logistics services can be developed by companies (Logistics Service Providers or LSP) through their products, processes, or services (value-added services). In regard to products, innovations can be made in logistics services through its scope of activities (e.g. door to door), modes (e.g. multimodal), geography (e.g. multi country) and goods (e.g. general, dangerous, special). In regard to process, innovations of logistics services can be made through customer prospecting (marketing), logistics operational design (operations), and financing (finance), so that their customers may feel a greater sense of ease, trust and satisfaction. In regard to service (value added services), innovations of logistics services can be developed based on additional services that can provide



easiness and integrated solutions to customers: for example, customs clearance, insurance, packaging, etc.

In terms of financial performance, the most important aspects for logistics service companies comprises of profitability, growth, and liquidity. Referring to profitability, logistics service providers (LSP), especially non asset-based LSP, should focus in handling the logistics activities of customers whose goods are of high value (e.g. projects or EPC, telecommunication, electronics, oil and gas, etc.). When regarding sales growth, on the other hand, logistics service companies should focus on penetration to increase the volume of transactions from their base of existing customers. After developing the strategy, they should also acquire new customers and develop new logistics services; so the sustainability of sales growth can be maintained. The company should, however, also pay attention to the quality of their customers. Bad customers will not only cause cash flow problems due to late payments or uncollectible receivable (AR), but more serious problems in terms of liquidity. Liquidity is a very important aspect of financial performance because logistics service companies must provide pre-finance for their customers' logistics activities. Therefore, the effective management of cash flow is the key for competitive advantage in the industry. Most companies have financial problems that are caused by a mismanagement of cash flow and working capital, which impacts the company's overall operations.

## **Conclusion**

Sensing Capability (SC) had a significant role in enhancing innovative logistics service (ILS) for logistics service firms (LSF), and also had a positive impact on financial performance (LSF-FP). Sensing Capability comprises of the ability to explore customer's logistics requirements, the ability to analyse customer's product characteristics, the ability to analyse customer's logistics operation pattern, and the ability to analyse market trends. Innovative logistics services (ILS) of logistics firms will include product, process, and services innovations. In turn, the innovative logistics services (ILS) will encourage their financial performance (LSF-FP), which itself encompasses profitability, growth and liquidity. Innovative logistics service (ILS), however, was not the only mediating variable for the effect of sensing capability (SC) on financial performance (LSF-FP). There was also other mediating variables.



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