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Improving Logistics Services of LSP to Minimize Logistics Outsourcing Risks in the Ceramic Industry*

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Abstract

Purpose: In the last few decades, the ceramic industry has become an important industry for Indonesia. The resulting product must be handled properly, because if material & product handling is not carried out properly it will impact on the quality of product. Based on the logistics outsourcing research gaps in the ceramics industry to logistics service provider (LSP), this study aims to analyze the logistics service improvement of LSP in accordance with the needs of the ceramic industry to minimize logistics outsourcing risks. **Research design, data and methodology:** In the field study, observations, interviews and surveys related to production and logistics activities in the ceramic industry & LSP were carried out. The next step is to analyze logistics service of LSP needed by the ceramic industry. **Results:** The final findings obtained from this research are the LSP need to improve 1) knowledge; 2) technology capability; 3) relationships; 4) service quality; 5) innovation; 6) commitment in services. **Conclusion:** In order to reduce logistics outsourcing risks in the ceramic industry, LSP in Indonesia need to improve the logistics services required by the ceramic industry with a focus on six areas of improvement.

Keywords : Ceramic Industry, Distribution, Logistics Service Provider, Outsourcing, Risk

JEL Classification Code: L52, L61, L87, L91, O14

1. Introduction

The ceramic industry is an important industry for Indonesia. This industry has a significant contribution to Indonesia's Gross Domestic Product because it is able to absorb a large number of workers and has a large export potential. Currently, the Indonesian ceramic industry is facing several problems related to the characteristics of raw materials, energy availability, and characteristics of finished products.

The characteristics of raw materials that are full of hazardous materials and the characteristics of the final

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product that are prone to damage are a challenge for the logistics and supply chain process. The need for gas distribution as an energy source to manage raw materials into final products is also still limited. The gas demand for the ceramic industry itself can reach 30% of the total production cost. The existence of gas does not only concern its availability in nature but also its distribution.

On the one hand, the ceramic industry needs to focus on its core business, namely how to produce quality products in accordance with market needs, meet sustainability aspects and meet export standards. On the other hand, the ceramic industry is required to be able to handle logistics process well, starting from the availability of raw materials, smooth production and distribution processes as well as transportation of the final product. In the midst of the high complexity of competition in dealing with foreign ceramic products, the ceramic industry needs to focus on its core business, so that logistics aspects that can be handled by third parties need to be delegated to logistics service providers who focus on logistics activities. However, currently the competence of logistics service providers is only limited to handling products in general (Sumantri, 2019). For logistics service providers who have competence in handling "fragile products & hazardous materials" are very limited (Sumantri, 2020a). They do not have sufficient knowledge and skills to handle the ceramic business sector. Only large-scale logistics service providers are certified to handle it.

Globally, ceramic products can be divided into ten main sub-groups, namely 1) bricks and tiles; 2) floor and wall tiles; 3) sanitaryware; 4) pottery & tableware; 5) refractories; 6) abrasives; 7) clay pipes; 8) expanded clay; 9) porcelain enamel; 10) technical ceramics. The manufacture of ceramic products is a complex interaction between raw materials, technological processes, people, and economic investment. The process includes the transportation and storage of raw materials and additives, preparation of raw materials, shaping, drying, surface treatment, baking and subsequent treatment (Quinteiro, Araujo, Oliveira, Dias, & Arroja, 2012).

Ceramic industry clusters in Indonesia are spread from South Sumatra; West Java; Central Java; Yogyakarta; East Java; Bali and Nusa Tenggara; West Kalimantan; and North Sulawesi. The location of scattered industrial clusters makes it difficult to supply the main raw material, in this case is clay. The supply of other raw materials such as sand, feldspar, quartz, kaolin and other minerals, also needs to involve third parties to distribute them so that the continuity of the ceramic industry can run continuously. In this case, the role of the logistics service provider industry is very helpful in the distribution process of these raw materials. The logistics service provider plays a role as one of the actors that supports logistics management for the ceramic industry and minimizes logistics outsourcing risks in the sector (Sumantri, 2019).

From the results of a preliminary literature study, observations and discussions with the Indonesian Ceramics Center which fosters the ceramic industry in Indonesia and discussions with logistics service providers which help logistics activities for ceramics industry, several challenges emerged from this sector. These challenges consist of 1) clusters of small and medium-sized industries that produce ceramics spread throughout Indonesia, so that many challenges arise in the distribution and transportation process; 2) the raw materials needed have various characteristics, some raw materials require extra careful material handling because they are included in the hazardous material category (Niziolek, Feinman, Kimura, Respess, & Zhang, 2018); 3) the ceramic industry requires a lot of energy, meanwhile for certain areas its availability is very limited and it requires reliable distribution and transportation so that energy supply can reach those areas (Normal, 2019); 4) the final product produced by the ceramic industry need material handling competence because it is a fragile product (Anggoro, Bawono, & Sujatmiko, 2015); 5) in order to focus on the core business of the ceramic industry, it is necessary to involve the logistics service provider industry that can handle qualified distribution and transportation (Agustin & Sumantri, 2017a, 2017b); 6) Currently, the competence of logistics service providers that support logistics and supply chain activities of the ceramic industry is still very limited and still requires a coaching process (Sumantri, 2020b).

Based on the existing research gaps, this study aims to analyze the risks that arise when logistics and supply chain activities in the ceramic industry are outsourced to LSP and the efforts that need to be made by LSP to overcome them. This study is expected to help logistics service providers in designing logistics business services that minimize logistics service outsourcing risks in point of view of customer needs, especially for ceramic industry customers. The next section of this paper will present the theoretical framework that supports this study and then describe the research methodology used. In the next section, the results of the research obtained will be discussed and closed with conclusions.

2. Literature Review

2.1. Logistics Outsourcing Risks in the Ceramic Industry

Supply chain can be viewed as the integration of various functional areas within an organization with the aim of improving the flow of goods from strategic suppliers

through manufacturing and distribution chains to end users (Tan, Shen, Langston, & Liu, 2010). The main objective of Supply Chain Management (SCM) is to maximize overall profits along the supply chain (Sumantri, 2020a). Therefore, it is necessary to increase supply chain management activities for business success (Zubayer, Ali, & Kabir, 2019).

SCM helps companies through optimizing core business practices, minimizing logistics costs, and increasing customer satisfaction. SCM is often faced with various uncertainties such as errors in demand forecasts, variations in lead times, natural disasters, machine breakdowns, and labor problems. Risk factors need to be considered in the management of a supply chain. These risks are unavoidable and therefore efforts must be made to reduce them (Zubayer et al., 2019).

Logistics risks come from various sources both inside and outside the organization (Sumantri, 2020a). Logistics risks can be thought of as exposure to events that hinder efficient supply chain management (Ghadge, Dani, & Kalawaski, 2012). Logistics risk is the probability and impact of an unforeseen event or condition that has a negative effect on any part of the supply chain that could lead to failure or deviation at an operational or strategic level (Zubayer et al., 2019). Logistics risk management is an "inter-organizational collective effort". Quantitative and qualitative risk management approaches can be used to identify, evaluate, mitigate and monitor unexpected and impacted events or conditions in logistics (Ho, Zheng, Yildiz, & Talluri, 2015).

Before discussing further about logistics risk in the ceramic industry, it is necessary to map the challenges that arise in the ceramic industry. Industry 4.0 has changed the traditional economic sector. The impact of the fourth industrial revolution is very influential on businesses with high levels of manual work as in the case of the ceramic industry which exports most of its production and competes on a global scale. This sector has an urgent need for the development, understanding and assessment of frameworks and business models in the Industry 4.0 era with a focus on technology, people and processes (Oesterreich & Teuteberg, 2016). As a result of a globalized world, the future of the ceramic industry sector is faced with several challenges that must be faced. The following are some of the challenges that arose, 1) the emergence of international-scale companies that have penetrated into the territory of other countries; 2) the emergence of sectoral consolidation so as to further enhance competitiveness; 3) the need to adopt lean manufacturing and use of new technologies; 4) the need for innovation to face Industry 4.0; 5) the need for industry reform through agile, efficient and flexible administration.

Logistics risk in the ceramic industry can be sourced from suppliers, manufacturers, distributors, retailers to end users (Zubayer et al., 2019). However, the intensity of logistics risk that occurs in each country is different. Different geographical characteristics, suppliers, manufacturers, customers make each country have a different focus on logistics risk. Especially if the logistics activities are outsourced to LSP. The risks that arise will increase in intensity. Based on the challenges that arise in the ceramic industry and outsourcing activities then logistics outsourcing risks in the ceramic industry can be classified as mentioned in Table 1.

Table 1: Majors of Logistics Outsourcing Risks in the Ceramic Industry

Logistics Outsourcing Risks	References
Demand risks	(Rathore, Thakkar, & Jha, 2017) (Ho et al., 2015)
Inventory risks	(Ghadge et al., 2012) (Gueant, Lehalle, & Fernandez-Tapia, 2013)
Capacity risks	(Qin, Rao, Gurnani, & Bollapragada, 2014)
Lead time risks	(Lin, 2016)
Price related risks	(Tsai, Lai, Lloyd, & Lin, 2012)
Supply risks	(Chatterjee & Kar, 2016)
Transportation risks	(Rathore et al., 2017)
Operational risks	(Borghesi & Gaudenzi, 2013) (Ghadge et al., 2012)
Environmental risks	(Ghadge et al., 2012)
Societal risks	(Rathore et al., 2017)
Economic risks	(Tsai et al., 2012)
Control risks	(Chatterjee & Kar, 2016)
Information flow risks	(Tsai et al., 2012)
Management risks	(Ghadge et al., 2012)
Market risks	(Tsai et al., 2012)
Process risks	(Chatterjee & Kar, 2016)
Quality risks	(Ghadge et al., 2012)

To be able to properly address logistics outsourcing risk, companies need to identify logistics outsourcing risk priorities. Therefore, research is needed to identify the logistics outsourcing risk that is most prevalent in an area in a country. After the most dominant logistics outsourcing risk has been identified, the ceramics industry and LSP as an outsourcing partner need to overcome the risk identified. In order to minimize logistics outsourcing risk, company should choose logistics service providers properly. Apropriate LSP is LSP who can minimize logistics outsourcing risk by improving the logistics service and capability.

2.2. Logistics Service and Capability of LSP

A well-managed logistics system can provide a sustainable competitive advantage for organizations because effective logistics management uses the right strategies to improve customer satisfaction (Celebi, Bayraktar, & Bingol, 2010). As an important component of Gross Domestic Product, logistics affects inflation rates,

interest rates, productivity, energy costs and availability, and other aspects of the economy. Logistics can help create a sustainable competitive advantage for organizations.

Logistics can be a source of competitive advantage if the organization can maximize its logistics capabilities. These capabilities can come from the internal logistics capabilities of the company or the logistics capabilities of its business partners. If the logistics activities in a company are outsourced to a third party company, then the capabilities possessed by the third party company can also be a source of competitive advantage for the company.

Among the references on logistics capabilities identified, the study by the Global State University Michigan Logistics Research Team is one of the most influential (Defee & Fugate, 2010). The study identified four logistics capabilities, namely positioning, integration, agility, and measurement as critical to achieving world-class performance. These four logistics capabilities have become the main reference sources for several further studies on logistics capabilities and competencies (Ding & Kam, 2012). Other competencies are Strategic Management; Operations Management; Service Quality; Customer Relationship Management; Information Technology; Service Networks; Business Process Management; Marketing; Inventory Management; Innovations; Human Resource Management; Cost Management; Corporate Culture (X. Liu, Grant, McKinnon, & Feng, 2010). The evolution of logistics competencies that the logistics service provider industry needs to have is market exchange, customized logistics solutions, joint logistics solutions to in-house logistics solutions (Ding & Kam, 2012). To achieve these efforts, a framework for the formation of LSP competencies is needed. From the framework already owned by LSP, it needs to be further developed into service design thinking and methods.

Logistics service provider (LSP) is a logistics company that helps certain business to carry out logistics activities for that business (Sumantri, 2019). LSP acts as a third party that provides basic logistics services and several other services tailored to consumer needs (Yeung, 2006). LSP is authorized by its customers to manage various logistics activities either partially or completely. There are differences in terms of logistics service providers, such as logistics alliances, contract logistics, distribution contracts, and third party logistics.

There are five reasons to outsource logistics activities to LSP, including saving costs, acquiring third party expertise, increasing market flexibility, increasing service scalability, and reducing time to market. The advantages of using LSP services are accelerating the benefits of re-engineering, gaining access to world-class capabilities, getting cash back, using existing resources for other purposes, re-evaluating problematic functions, increasing company focus, and reducing operational costs.

Activities that can be carried out by LSP include transportation, warehousing, cargo consolidation and distribution, product labeling and packaging, inventory management, traffic management and fleet operations, cargo payment and inspection, cross docking, product returns, order management, packaging, carrier selection, tariff negotiation, and logistics information systems. There are 15 activities that are most often carried out by LSPs. These activities are transportation operations, cargo consolidation, distribution to end customers, cargo payments, warehousing, reverse logistics, information technology systems, EDI capabilities, traffic control for distribution, transportation planning, route optimization, inventory management, order management, cross docking, and traffic control for supply (Hofer, Knemeyer, & Dresner, 2009).

The key element in the logistics chain is the transportation system, which accounts for a third of the total logistics costs. Transportation is a major logistics function that involves moving and relocating material assets, products in process, and finished products using transportation technology. Transportation activities include coordination of transportation modes, long-distance transportation services, tracking and tracing.

The variety of services and capability that can be provided by LSPs and the high level of competition between companies make it necessary for companies to choose an LSP that suits the needs of the company. Inaccuracies in the selection of LSP lead to failure in the process of outsourcing logistics activities. On the other hand, if the company is right in selecting the LSP according to the required criteria, cooperation with the LSP provides many business benefits. These logistics service and capability should be provided by LSPs to their customers so that they can work together in the long term. This long-term collaboration can be created if the LSP can perform excellent logistics service and capability. The following is a table of logistics services and capability provided by LSP.

The logistics services and capability shown in the previous table are general logistics service and capability of LSP needed by customers. To be able to minimize logistics outsourcing risk in the ceramic industry, the ceramic industry needs to identify logistics service and capability minimizing logistics outsourcing risks. After ceramic industry has identified the logistics service and capability minimizing logistics outsourcing risk, ceramic industry should identify performance of the logistics service and capability. From that process, ceramic industry know the critical logistics service and capability of LSP which must be improved. The information can be informed to LSP to improve the logistics service and capability which is provided.

Table 2: Logistics Service and Capability of LSP

No.	Logistics Service & Capability	(Bayazit & Karpak, 2013)	(Liao & Kao, 2014)	(Hwang, Chen, & Lin, 2016)	(Karrapan, Sishange, Swanepoel, & Kilbourn, 2017)	(Sremac, Stevic, Pamucar, Arsic, & Matic, 2018)
1.	Low cost of service	√		√		
2.	Strategic Location	√				
3.	Information technology capabilities	√				√
4.	Data security			√		
5.	Order tracking		√			
6.	Order condition		√			
7.	Vehicle eligibility	√				
8.	Payment document accuracy			√		
9.	Service area coverage		√			
10.	Service flexibility	√	√			
11.	Service reliability					√
12.	Service diversity			√	√	
13.	Service speed				√	
14.	On time delivery		√	√	√	
15.	Service innovation				√	
16.	Responsiveness		√			
17.	Accountability		√	√		√
18.	Experience			√		
19.	Reputation			√		
20.	Delivery accuracy		√		√	
21.	Relationship with customers				√	
22.	Sustainable development			√	√	
23.	Employee knowledge competence					√
24.	Employee professionalism					√

3. Research Method

3.1. Location of Research Objects, Population and Sampling

The chosen strategy of inquiry in this research are observation, interview, and survey. The unit of analysis is at the industrial cluster level engaged in the ceramics industry and LSP industry as logistics service outsourcing partner of ceramic industry. This study will observe the object of research consisting of clusters of ceramic industry in Indonesia, specifically covering West Java, Central Java, Yogyakarta and East Java and the logistics service provider cluster used by the ceramic industry. The regions are selected because the regions are producers of ceramics that are quite productive and have export quality products. The sample taken are 100 ceramic businesses which are 15% of the total SMEs in the region. LSP involved in this research is LSP used by ceramic industry to assist the logistics process. The sampling technique used in this research is non-probability sampling using purposive sampling. Each organization is represented by one informant who is the owner or employee who has the position of being in charge of distribution and transportation.

3.2. Methods of Data Collection, Processing and Analysis

This study has some necessary data taken from primary and secondary sources. A primary survey was conducted to companies engaged in the ceramic production sector. All ceramic companies involved in this study have been operating for more than 5 years. The contact person involved in this study is the person who determines the logistics policy, such as the owner of the company or logistics & supply chain management. The following is the primary data needed in the research, namely the majors of logistics outsourcing risks; logistics service and capability of LSP influencing logistics outsourcing risks in point of view of ceramic industry; perceptions and expectations of ceramic industry about logistics service and capability of LSP influencing logistics outsourcing risks. Secondary data collection in this study involves data issued by the agency or institution that supports the research. Secondary data consists of the number of small and medium industries engaged in the ceramic industry in Indonesia. The technique or method of collecting data used in this research is to carry out a primary data survey in the field and a secondary data survey from available documents. The next process is

processing and analyzing the data that has been obtained. Below is the explanation of each process.

In detail the steps are as follows. First, collect and analyze data on industry profiles engaged in ceramics and logistics service providers who are logistics partners in the ceramics industry. The next step is to analyze the potential logistics outsourcing risk that often occurs in the ceramic industry. After that, it was continued by analyzing logistics service and capability influencing logistics outsourcing risks. Furthermore analyzing the condition of the logistics service and capability provided by LSP to the ceramic industry and identify logistics service and capability improvement needed. Then proceed with the classification of logistics services that need to be improved to reduce logistics outsourcing risks.

4. Results and Discussion

4.1. Logistics Outsourcing Risks in Ceramic Industry

The potential risks that can occur when the ceramic industry carries out logistics outsourcing have been summarized in Table 1. From these potential risks in Table 1, this study is directed to analyze the five biggest risks faced by the ceramic industry when logistics activities are outsourced to LSP through indepth interview with ceramic industry. The ceramic industry was asked five risks that often occur when the ceramic industry delegates its logistics activities to LSP. From the interview results, there are five logistics outsourcing risks that often occur, namely demand risks, lead time risks, transportation risks, quality risks and supply risks, as shown in Table 3. From the five biggest risks, a ranking process is then carried out using pairwise comparisons between one risk and another. From this process, the following is an order of five risks from the largest to the smallest when the logistics activities in the ceramics industry are outsourced to LSP.

Table 3: Ranking of Logistics Outsourcing Risks

Ranking	Risks
1	Demand risks
2	Lead time risks
3	Transportation risks
4	Quality risks
5	Supply risks

After the biggest risks faced by the ceramic industry are identified, the next step is to look for ways to reduce the five biggest risks. This risk will be reduced if LSP as an important actor in logistics outsourcing activities can maximize the logistics services provided by utilizing its resources and capabilities to the fullest. In order to maximize logistics service, LSP should identify the performance of the logistics service and capability. LSP service and capability are evaluated which need to be improved so that the biggest risks can be corrected from the ceramic industry's point of view.

4.2. Analyzing Logistics Service and Capability of LSP to Minimize Logistics Outsourcing Risks

Initial information about logistics services and capability of LSP was obtained through a literature review as mentioned in Table 2. From the list, it was then identified logistics services that can reduce the risk of logistics outsourcing in the ceramics industry. In the ceramic industry's point of view, based on the results of interviews and questionnaires given to respondents in the ceramic industry, there are 16 logistics service and capability that are responsible to minimize the 5 risks of logistics outsourcing. The sixteen logistics service and capability are shown in Table 4.

Table 4: Logistics Service and Capability of LSP to Reduce Logistics Outsourcing Risks

Code	Logistics Service and Capability
A3	Information technology capabilities
A5	Order tracking
A6	Order condition
A7	Vehicle eligibility
A10	Service flexibility
A11	Service reliability
A13	Service speed
A14	On time delivery
A15	Service innovation
A16	Responsiveness
A17	Accountability
A18	Experience
A20	Delivery accuracy
A21	Relationship with customers
A23	Employee knowledge competence
A24	Employee professionalism

After knowing the logistics service and capability that support efforts to minimize logistics outsourcing risk in the ceramics industry, the next step is to evaluate the performance of LSP in that logistics service and capability.

4.3. Logistics Service and Capability Perception, Expectations and Gap

The perception questionnaire was used to measure "what the customer feels" about the logistics service and capability provided by the LSP. The expectation questionnaire was

used to measure "what customers expect" of the logistics service and capability provided by the LSP. Each of these variables is filled with a Likert scale of 1-5, where 1 indicates a very low score and 5 indicates a very high score.

Gap analysis is used to calculate the difference between "perceived by customers" and "desired by customers" on the logistics service and capability provided by the LSP. Logistics service and capability that have a negative gap (expectation level > perception level) indicate that logistics service and capability provided by LSP is lower than what customer expected. The average score of perception, expectation, and gap analysis of logistics service and capability of LSP is shown in the following table.

Table 5: Average Perception, Expectations and Gap Scores of LSP's Logistics Service and Capability

Code	Average Perception Score	Average Expectation Score	Gap
A3	3,80	4,60	-0,80
A5	3,97	4,63	-0,67
A6	4,33	4,40	-0,07
A7	4,43	4,43	0,00
A10	3,73	4,33	-0,60
A11	3,77	4,33	-0,57
A13	4,13	4,70	-0,57
A14	4,00	4,67	-0,67
A15	3,73	4,37	-0,63
A16	3,97	4,63	-0,67
A17	3,90	4,58	-0,68
A18	4,33	4,23	0,10
A20	4,27	4,43	-0,17
A21	4,10	4,63	-0,53
A23	4,17	4,27	-0,10
A24	4,27	4,27	0,00

Referring to the table above, there are 13 logistics service and capability that have negative gaps, namely information technology capability (A3), order tracking (A5), order condition (A6), service flexibility (A10), service reliability (A11), service speed (A13), on time delivery (A14), service innovation (A15), responsiveness (A16), accountability (A17), delivery accuracy (A20), relationship with customers (A21), and employee knowledge competence (A23). Logistics service and capability that have a negative gap score will be corrected in this study, so that it will be continued in the next calculation. Logistics service and capability that have a positive gap are not continued in the next calculation because these logistics service and capability are considered good.

4.4. Improvements for Logistics Services and Capability to Reduce Logistics Outsourcing Risks

The next step in this research is to analyze the improvements that need to be made by LSP on the logistics services and capability provided in order to reduce logistics outsourcing risk. This step is carried out by in-depth interviews with ceramic industry as customer of LSP. The results of customer expectations are shown in Table 6 in the fourth column and then logistics service and capability that should be improved can be classified into knowledge, technology capability, relationships, service quality, innovation, and service commitment as can be seen in Figure 1.

Table 6: Logistics Service and Capability Improvement Based on Customer Expectation

No.	Code	Logistics Service and Capability	Improvement	Classification
1.	A3	Information technology capabilities	easy, complete	Technology Capability
2.	A5	Order tracking	fast, easy, innovative, reliable	Service Quality
3.	A6	Order condition	safe, guaranteed, cautious	Service Quality
4.	A10	Service flexibility	flexible, customizable, helpful	Service Quality
5.	A11	Service reliability	reliable	Service Quality
6.	A13	Service speed	fast, quick	Service Quality
7.	A14	On time delivery	guaranteed, on time	Service Quality
8.	A15	Service innovation	innovative, new	Innovation
9.	A16	Responsiveness	fast, quick	Commitment
10.	A17	Accountability	fast, professional, standard, responsibility, relief, satisfying, helpful	Commitment
11.	A20	Delivery accuracy	accurate	Service Quality
12.	A21	Relationship with customers	professional, humane, friendly, careful, helpful	Relationships
13.	A23	Employee knowledge competence	comprehensive, standard, reliable	Knowledge

In order to reduce logistics outsourcing risk, LSP contribute to improve operational capabilities such as distribution, order fulfillment, tracking and tracing, storage and delivery of goods to manufacturing and retail, assisting business management management (such as purchasing, operations, human resources, and financial management), value added services, reliability service, customer responsiveness, relationship building, information integration, innovation and flexibility (Darkow, Weidmann, & Lorentz, 2015; Hartmann & De Grahl, 2011; C.-L. Liu & Lyons, 2011; Lu & Yang, 2010). The LSP capabilities can be grouped into three types of capabilities, namely strategic, operational, and network (X. Liu et al., 2010).

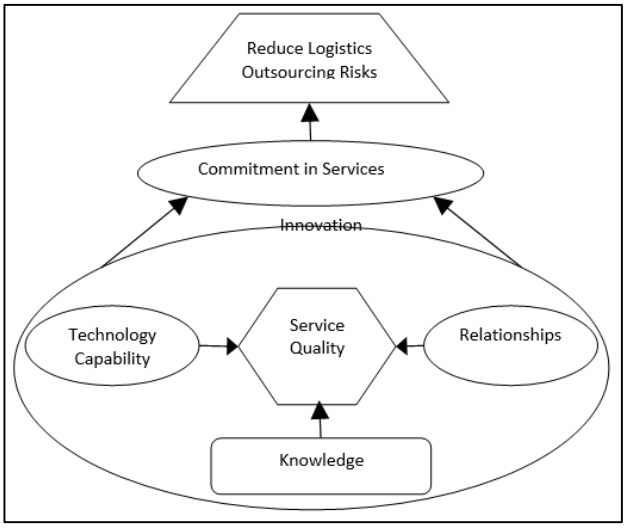

Figure 1: Logistics Service and Capability of LSP to Reduce Logistics Service Outsourcing Risks

Logistics service capability refers to the ability of logistics service companies to manage and integrate processes in the transportation chain to provide one-stop logistics services to enhance the company's competitive advantage and superior performance. The capabilities related to logistics services are recognized as a key source of superior performance, one of which is by providing low costs (Sumantri, 2019). To be able to quickly combine low costs with a number of differentiation strategies in response to service requirements requires well-established operational routines that can generate distinct benefits (Ding & Kam, 2012).

The logistics service and capability provided by LSP can help the ceramic industry in reducing the risk of logistics outsourcing. The logistics service and capability provided by LSP are resources that can be utilized by the ceramic industry to achieve a competitive advantage. Resources owned by LSP can be a source of competitive advantage not only for LSP but can also be a source of competitive advantage for industries that use LSP services, in this context the ceramic industry.

LSP resources can lead to competitive advantage if they are valuable, rare, inimitable, and non-substitutable (Darkow et al., 2015; Ellram, Tate, & Feitzinger, 2013). Logistics service and capability of LSP as a part of LSP resources can be used to facilitate value creation with specific product and service offerings (Priem & Swink, 2012). Logistics service and capability of LSP can assist customers to access international markets and deliver products at lower costs (Darkow et al., 2015; Zacharia, Sanders, & Nix, 2011).

Several categories of resources owned by logistics service providers which can also be an alternative to reduce logistics service outsourcing risk include physical resources (transportation equipment including vehicles, ships, containers, cargo handling equipment, and terminals); human resources (e.g., skilled employees); information systems (e.g., cargo tracking, electronic data interchange, and internet facilities); corporate image (e.g., financial stability, reputation, record of damages and losses); network (e.g., frequency of cruises and departures, geographic service coverage, agents); knowledge; and relational resources (e.g., long-term contracts, subcontractors) as can be seen in Table 7 (Cui & Hertz, 2011; Darkow et al., 2015; Wong & Karia, 2010).

Table 7: Resources Owned by LSP to Minimize Logistics Outsourcing Risks

Resources Owned by Logistics Service Providers	Reference
Physical	(Wong & Karia, 2010)
Information systems	(Yang, Marlow, & Lu, 2009)
Human	(Wong & Karia, 2010)
Corporate image	(Yang et al., 2009)
Network	(Yang et al., 2009)
Knowledge	(Wong & Karia, 2010)
Relational	(Wong & Karia, 2010)
Service reliability	(Yang et al., 2009)
Flexibility	(Hartmann & De Grahl, 2011)
Information integration	(Yang et al., 2009)
Relationship building	(Yang et al., 2009)

When the logistics services and capability provided by the LSP have been improved and the other resources of the LSP have been maximized, the next step is to build innovation. Innovation is the key to the progress of society, economy and company growth. The development of innovation competence has become a very important strategic goal for logistics service providers (Halldorsson & Skjott-Larsen, 2004). Enterprise process innovation implementations increasingly rely on logistics-oriented solutions. Innovation can also be defined as subjective novelty which is the result of a conscious management process and which aims at economic exploitation. Logistical innovations must be manageable and serve the purpose of economic exploitation. Competence for innovation may consist of new value creation; external relationships; job-to-be-done; organizational transitions; multi-faceted dimensional service offerings; supply chain performance.

Efforts to reduce logistics outsourcing risk carried out by LSPs and customers can support the internationalization of LSP and customer services. Multinational companies are required to always adjust their supply chain configurations as well as their business and operational strategies in order to better adapt to changing characteristics of the global economy, national markets, as well as customers and suppliers (Casson, 2013; Kusaba, Moser, & Rodrigues,

2011; Lorentz & Ghauri, 2010). Logistics service providers must understand the impact of internationalization on their operations, customer's operations and the business as a whole in order to properly allocate and develop their limited resources and capabilities (Darkow et al., 2015).

This study has mapped the efforts that need to be made by LSPs so that logistics outsourcing carried out by the ceramic industry to LSPs can minimize logistics outsourcing risk. There are many types of services, capabilities and resources that can be maximized in an effort to minimize logistics outsourcing risks. However, this study only explores a small part of the service, capability and resources that are considered important by the ceramic industry as customers of LSP. For further studies, services, capabilities and resources can be explored more intensively which can be used as a means to reduce logistics outsourcing risks by considering customer needs according to the context of the research being explored. Furthermore, this study focuses more on efforts to improve logistics service providers as logistics outsourcing companies. Future research is expected to analyze the improvement efforts needed for companies that decide to use logistics service providers in managing their logistics activities.

5. Conclusions

Logistics outsourcing activities in the ceramics industry delegating to logistics service providers provide a number of benefits and also bring a number of risks. Simultaneous efforts from the LSP and the ceramics industry are needed to reduce these risks. Efforts that can be made to minimize logistics outsourcing risk are improving the logistics service quality provided by the LSP and optimizing the resources and the capabilities of the LSP such as knowledge, technology capability, and relationships. All of logistics services, resources and capabilities are framed in the spirit of innovation so that commitment is realized in providing logistics services to LSP partners, which in the context of this research is the ceramic industry.

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