Malaysia Construction Logistics Performance Through A Lens Of Communication And Supply Base Strategy

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Abstract

The purpose of this study is to identify the relationship between the number of suppliers and defective communication with the logistics process in construction projects and how it affects its performance, specifically in Malaysia. The study was conducted in a qualitative format, with four semi-structured interviews. These interview sessions were performed with construction players such as senior quantity surveyor, assistant project manager and project executive. In addition, the collected data were analysed using a thematic analysis approach. As a result, there are six (6) factors, namely numbers of strategic suppliers, effective communication, tracking facilities, cost transparency, early involvement of suppliers at the design stage and benchmarking, that have been identified that can boost logistics performance in construction. However, for this paper, only two factors were highlighted, and three (3) sub-factors have been discovered that would affect the performance of construction logistics in Malaysia. As a result, a positive outcome of this study would be to contribute to the acquisition of current research knowledge and make recommendations for future research.

Keyword - Logistics management, Construction logistics, Performance measurement, Construction management

1. Introduction

Nowadays, logistics and distribution are getting more complex and advanced than before. Originated from the military sector, logistics is seen as planning and moving and maintaining military forces. Logistics shows its importance during world war II, where the army operation such as movement of food supply, medicine, soldiers, artilleries and others across the border (Kain & Verma, 2018). Logistics in the military sector have been practised since old age, and modern military shows substantial need to solve logistics problems. In this current era, logistics management can be defined as the fragment of the supply chain management that schedules, manages and regulates the practical, effective forward and reverse movement and storage of products, resources and related information

between the point of production and the point of consumption to satisfy consumer requirements." (Council of Supply Chain Management Professionals (CSCMP), 2016)

According to (David Wu, 1999), logistics management can be seen as the operating sequences that increase the efficiency of the project and at the same time also give rivals a competitive advantage by decreasing the cost and production time. It is possible to break the task of logistics management into two. In short, the objective of logistics management is to minimise costs and make the system "cost-effective". In the construction industry setting (Lundesjo, 2015), logistics include transporting materials, plant and machinery and information to the correct location, time, efficiency, quantity and fair price. (Moone, 2015), added that the concept of building logistics goes beyond the movement of building materials to the construction site.

According to (Asnaashari, 2011), the awareness of the importance of logistics management in the construction sector is deficient compared to other sectors like manufacturing, trading, etc. Following the example of other sectors, attempts are being made to incorporate construction logistics into the logistic chains of suppliers and consumers, from suppliers of raw materials, manufacturers, distributors and end-users.(Sabotska & Agata, Czarnigowska, Stefaniak, 2005) One of these consequences may be a lack of productivity due to inadequate logistics management practices. Logistics management has been shown to have a direct and indirect relationship to productivity losses. (Almohsen, Ca, Ruwanpura, & Ca, 2011)

Logistics performance monitoring is essential to identify the status and potential for change in logistics. (Minges, 2017) In ensuring that the logistics process are working well, the organisation needs to determine various aspects of the logistics flow of the supply chain. With the increased importance of logistics in construction, the evaluation of logistics effectiveness and efficiency is gaining increased attention by academia. (Wegelius-Lehtonen, 2001) Thus, the purpose of this study will explore how performance can be improved through the aspect of communication and supply base strategy. This paper aims to identify the relationship between the number of suppliers and defective communication against the logistics process in construction project and how it affects its performance, specifically in Malaysia.

2. Literature Review

Table 1 below shows that throughout the years, the performance measurement in the logistics industry has been studied and improvised. Nevertheless, it portrayed that the study of performance measurement in the logistics industry has become significant. Its model from various aspects has been established to improve the logistics process in that industry.

Following the trend, in the year 2001, researchers have also started to see the importance of logistics in the construction industry in the construction industry. Based on table 1, several studies have been conducted on improving logistics performance in the construction industry. However, comparing to other industry, it can be seen that less study has been conducted in this area, specifically in Malaysia.

Figure 1 past literature on performance base on sectors

Field	Author(s) and year	Essence(s)
Logistics industry	(Lenin, 2014), (2007)	Establish a conceptual structure for logistics efficiency that focuses on four elements responsiveness, quality, efficiency, and flexibility
	(Töyli, Häkkinen, Ojala, & Naula, 2008), (2008)	Indicated that logistics efficiency consist of 3 components; level of service, level of perfect order and cycle, and level of logistic cost
	(Fugate, Mentzer, & Stank, 2010), (2010)	Reveals interaction between logistics performance and organisational and it seen as multidimensional.
	(Mansidão, Coelho, & Mansidão, 2014), (2014)	Focuses on the performance of operational, organisational and competitive advantage
Construction industry	Hill and Ballard (2001)	Establish a basis for successful logistics in construction project
	(Fang & Ng, 2011), (2011)	Create an overall construction logistics cost diagram
	(Asnaashari, 2011), (2011)	The proposed conceptual model for holistic construction logistics system
	(Ying, Tookey, & Roberti, 2014), (2005)	Measure effective construction logistics through intrinsic and extrinsic elements

Based on the previous study conducted by (Usman & Ibrahim, 2015) and (Ghanem, Hamzeh, & Zankoul, 2018), six factors have been identified to improve logistics performance in the construction industry. Those six factors are the number of suppliers, tracking facilities, defective communication, cost transparency, involvement of supplier, and

benchmarking. However, this paper has decided to focus more on the following factors: defective communication and the number of suppliers.

Strategic number of suppliers

In the past years, the most widely found practise in the management of the supply base has centred on the number of suppliers the focal firm has retained in its supply base.(Choi & Krause, 2006) In particular, a study on the supply base has been concerned with rationalisation measures, such as the reduction of the number of suppliers in the supply base, how the supply base should be structured, and how businesses should relate to the suppliers in the base, as well as how these relationships evolve over time. (Holmen, Pedersen, & Jansen, 2007)

By decreasing their number, the number of suppliers should be rationalised. According to (Monczka, J., & Callahan, 1993), the number of the suppliers and the most appropriate suppliers for a client can be optimised. A research done by (Bygballe & Persson, 2015) revealed that an extensive supply base reduction strategy has been used by many companies in various sectors. Many of these company have claimed that they have reduce the size of their supplier bases to become more competitive, flexible and cost efficient. This will ensure the delivery material will be more efficient. Rationally, a chain with a fewer number of suppliers is easier to manage thus logistical barrier can be reduced.

Figure 2 Review on communication

Author(s) & Year	Key element
(Monczka et al., 1993), (1993)	Discovered competitive buying firms as a factor that influence the performance impacts and competencies of suppliers
(Choi & Krause, 2006), (2005)	Looking into supply based and its complexity by conceptualise it in three dimensions through four propositions; cost of transection, risk involved, responsiveness and its innovation.
(Holmen et al., 2007), (2007)	Establish and conceptualised the how a develompent of network of supply in a company and how the
(Bygballe & Persson, 2015), (2015)	Study on trend that affect company's supply base by highlighting its complexity and interdependence and the type of strategy of supply base that they use.

Defective Communication

Based on a study conducted by (Pokharel, 2005), he suggested that a strong communication system aids to carry out activities more effectively, facilitates autonomous decision-making processes and enable logistics operations to achieve higher logistic performance, meets client service expectations and decreases operating costs by as much as 50 per cent of total logistic costs over conventional business practices. Meanwhile, research conducted by (See, 2007) centred on the convergence of logistics management with information and communication technologies.

The success of the logistics in construction holistically indicate the success of each phase in logistics managements. (Greenwood & Wu, 2012) stated that to achieve the objectives related to quality, precise time delivery and cost, it is recommended to have a close relationship with suppliers. The communication of suppliers, design team and construction team should not be fragmented to ensure that the information flow from one to other. Thus, the plan or method of communication in the project should be deployed and mobilised and productive at every stage of logistics management. (Usman & Ibrahim, 2015)

Figure 3 Past review on supply base strategy

Author(s) & Year	Key element
(Pokharel, 2005), (2005)	Acknowledge the implications of ICT in logistics in Singapore. Understanding ICT motivators and obstacles will enable law makers to implement better policies and initiatives, if necessary, to increase ICT penetration.
(See, 2007), (2007)	Addressing the logistics management intergation with information and communication technology in order to significantly increase the performance of logistic fleet operations.
(Greenwood & Wu, 2012), (2010)	Show a positive relationship between working in collaborative manner and project performance.
(Usman & Ibrahim, 2015), (2015)	Conceptually integrate the approaches and issues that occur in the perspective of logistic construction management, with the goal of presenting a potential solution.

3. Methods

The study was conducted with four (4) selected construction organisation in Klang Valley Selangor that represent several types of parties/ players in construction project namely assistant project manager cum interior architect, project executives and senior quantity surveyor. As for this study a semi-structured interview method had been used to all informants of each organisation. The interview session was held around 40 min to one hours at selected places. The interview questions were divided into three sections (section A, B, and D). Basically, section A were about demographic question of the informant. Whereas, section B was focusing more on the logistics activities in construction project. Followed by section C where the question was focusing on the performance of construction logistics. Pseudonyms or alias have been used to differ informant's name for confidentiality purpose. The interview sessions were recorded, and the conversation was transcribed to ease of following analysis.

Figure 4Summary of Interviewee profile

Construction Organization	A	B	C	D
Designation of interviewee	Assistant project manager cum interior architect	Construction manager / Quantity surveyor	Project executive	Project manager
Type of organisation	Main contractor (Interior Design)	Developer	Main Contractor	Main Contractor
Experience in construction industry	4 years	20 years	5 years	25 years
Type of project	Building project	Building project	Building project	Building project

A voice recorder has been used to collect the data and mobile phone have been use also as a backup if anything happened to the recorder. After the interview session have been done, a thorough analysis has been done by listening back the recording and the voice data have been transcribed to allow the researcher to quote the exact data from interviewee and to pick up several section to this research paper. To make the analysis handier, the researcher will run the written transcription to Atlas.ti 8 to gather the theme and sub them so that all the data can be organised accordingly to develop a model.

4. Findings & Result

The review of the interviews yielded various findings, which are described in this section. As described in table 4 in method section, four construction organization profile have been interviewed for to prepare for this section. while a conceptual framework of construction logistics performance through lens of communication and supply base strategy have been drawn at the end of this section.

Accountable supplier

One way to obtain competitive advantage is by optimising the number of suppliers from which they procure. A smaller supplier base ensures that a better and long-term relationship may be formed. Based on the interview conducted, the suppliers that they shortlisted are the ones that are capable of supplying material regarding any situation. No specific number of suppliers indicate a "good" number to reflect an excellent supply base. However, most of them believed that having a liable supplier to supply material to carry out the project is better than having a large supplier.

"For example, for carpentry work normally, we would ask the carpentry specialist to buy the material needed for this project. However, we will give them a list of prices for that woodworks, and they must buy the material within that price given in the list. ……. It is easier if they are the ones who buy the material for carpentry work as they will know much is the actual material needed."
(Informant A)

Effective communication

Information sharing plays a significant role in developing a cost-effective and flexible logistics management in the construction project. The architect is responsible for dealing with his or her consultants, whereas the main contractor is responsible for interacting with suppliers and subcontractors. The main contractor's main point of connection on a project is usually the superintendent. All construction communication is centred on the contract documents, including drawings, specifications, change order forms, and information requests. Any direct communication not indicated in the contract agreements must be authorised. Any changes to the scope or timeline that must be made must be documented and notified through the appropriate channels. Most of the informant in this paper has highlighted the importance of effective communication to smoothen the logistics process. In this case,

"….a communication between contractor and supplier in term of order planning at the early stage is very important as ordering period would take a minimum of 7 days" (Informant D)

Price-based in selecting suppliers

The interview finding show that all informants agree that the cconstruction estimators depend primarily on subcontractor and supplier sub-offers in competitive pricing to meet a final tender number submitted to the client earlier. It also indicated that the lowest tender is a decisive factor in winning work in typical competitive tendering environments; estimators also need to select suitable tendering subcontractors who offer competitive rates that contribute to the ability of the main contractors to win tenders.

"… so normally we would take three prices from three company… company A, B and C would fairly compete for its price…the one that offers quality with the lowest price would be our main choice." (Informant C)

Subcontractor freedom to manage suppliers

Subcontractors are firms or individuals that main contractors employ to help them to complete a project. They report to main contractors, not the client. However, as the contractor is responsible for handling several parts of the main contractor project responsibilities, payments, and other business activities. Referring to the quotation from informant A, it can be interpreted that the main contractor is giving the freedom to subcontractor to manage their own supplier rather than they manage it themselves.

"… we would ask our carpenter to buy their materials. The reason being is that they can accurately estimate the material needed for that project and to avoid wastage." (Informant A)

Consultant approval

Typically, the purchase order (PO) starts with a purchase request. Whenever a person in charge of material order, such as a project manager that wants construction supplies on-site, they can submit a procurement request to their buying department. A sales request demands permission to make a purchase order. If the consultant has accepted the request, it will produce a purchase order for further actions to be submitted to the buying department.

"Basically, we as Interior Design contractor will not make any early materials purchase. We cannot "lock" the item that we want to use early since all purchase need to be approved by the consultant of the project" (Informant A)

Based on the quotation below it indicated that a good communication between contractor and consultant play an important role especially in decision making. A fast decision would enhance purchasing process and improve logistics process.

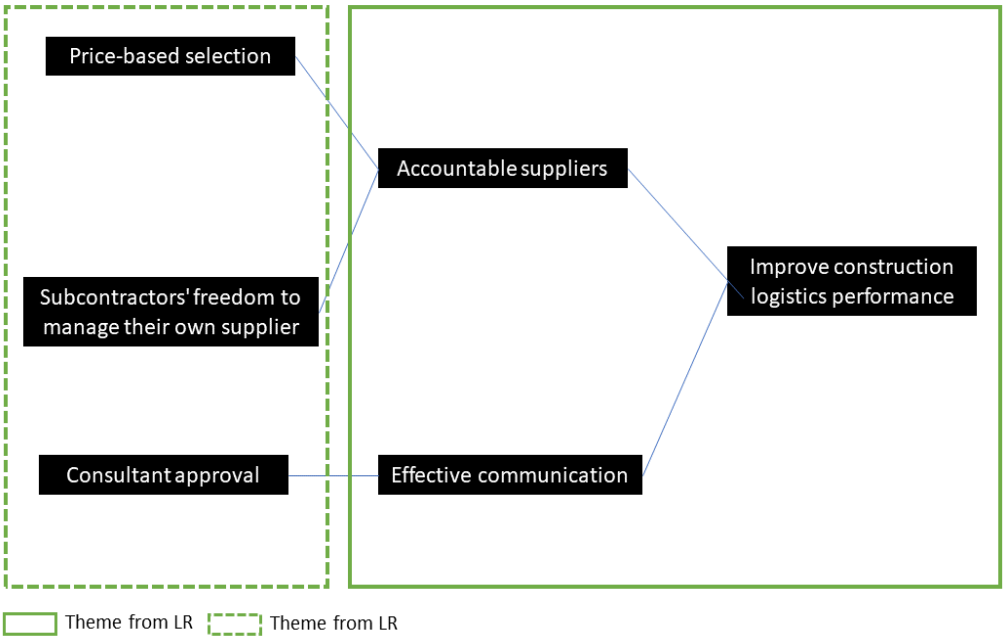

Figure 5 Conceptual framework of construction logistics performance through lens of communication and supply base strategy

5. Discussion

This paper is applying the value of qualitative research by presenting an actual situation of the logistics scenario in construction projects. It illustrates diverse construction organisations' perspectives of the value of strategic suppliers and effective communication in a construction sprojects. As mentioned earlier, these two factors are significant in improving logistics performance in construction industry in Malaysia.

From the study conducted, there are three (3) new sub theme that have been identified from two main themes namely price based in selecting supplies, freedom for subcontractor to manage their suppliers and consultant approval. The elements such as selecting supplies, suppliers management and consultant approval is slightly different from the work of (Chenthoorun & Me, 2017), (Usman & Ibrahim, 2015) whereby the conceptual definition of each component is from the perspective of various users towards various element of “number of suppliers” and “defective communication” that will lead to improved construction logistics performance. The finding reveals that there is a positive attitude towards having an effective communication and establishing good supply base. Based on the interview, it can be interpreted that an effective communication is referring to a smooth communication channel with less “hiccup” from one party to another. It is also discovered that a process of inquiring for approval from top management to purchase materials for a project would take a long process. Thus, it is suggested that upper and downward communication is sometimes obstructed as the size of project increase, it is better to decrease hierarchical levels approval.

As for strategic supply base, the interview data reveal that by having small number for suppliers to reduce logistical barrier is not enough to indicate it as an excellent strategy to improve construction logistics. The value of accountable supplier is added as sub-factors to strategic supply base as most of the informant believe that related to decision making, action taken and outcomes. In other words, suppliers that accept responsibility for doing everything it takes to fulfil the goals set out. In addition, selecting supplier based on price is also influencing supplier base strategy as they believe that low price is the best value for money which is contradict with a research done by Choi & Krause, (2006) as they believe that low price will open up to many uncertainty such as quality.

Furthermore, there are four (4) other elements contribute to performance of logistics in construction industry which is not being documented in this paper. These findings offer key insights and as an indicator that earlier studies

by (Ghanem et al., 2018; Usman & Ibrahim, 2015), appears to be vital in the perspective of Malaysia construction logistics performance.

6. Conclusion

From this exploratory analysis, it can be conclude that there are several emerging elements from the theme of "number of suppliers" and "defective communication" that may affect the performance of logistics in construction industry especially in context of Malaysia. All in all, this paper concluded that by improving strategic suppliers and strengthening communication among construction parties are very crucial especially to logistic process in construction project to bridging the gap to improve logistics performance. By reviewing the interview data, it seems like there is still a room for improvement to establish their supply base and communication system. They were still bound by the adversarial character of the conventional construction working culture. Thus, it will require all parties in the project to implement the changes. It is time for them to shift their perspectives and attitudes. These phenomena that have been discovered will require an in-depth exploration to extend and understand its capability and ability for future improvement. More players in construction industry views on the same background should be applied for future report.

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Biography

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