

# Malaysian Bumiputera Contractors' Supply Chain: A Preliminary Appraisal

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**Abstract.** The construction industry is an industrial sector that is complex and dynamic. As a developing country, Malaysia recognizes building as one of the main contributors to the economy of the country. Hence, being one of the economic drivers, the construction industry needs to ensure it remains important and competent by venturing successful strategies applied by other sectors. The implementation of supply chain management, especially in the manufacturing sector, has been positive and has produced the expected benefits such as cost reduction, competitive advantages, improved productivity, value creation and better relations between parties. This study aims to review reported outcome on Bumiputera contractors' supply chain network. Additionally, this study also intent to analyse the main categories of risk that affect the Bumiputera contractors' project performance which related to their approach on supply chain management. Current research papers on relevance to the issue were critically reviewed. The results from the structured literature review managed to identifies that supply chain is not used extensively among the Bumiputera contractors. Additionally, risks associated with the supply chain network in construction industry can be further categorised into external and internal factors such as cooperative risk, financial risk, technology risk and economic risk. The result have aspired a better understanding between the supply chain management with sustaining project performance among Bumiputera contractors. This study is a part of an on-going contract research with the overall aim to model supply chain network using risk parameters which will be identified at later stage of this research.

## 1. Introduction

Construction supply chain is a chain network that intends to meet the demand between client, integrate the material, information management, and engage integrated management between supplier, subcontractor or other participants [1]. Thus, the fundamental challenge of supply chain networks is to plan and control the demand and supply gap within the chain to achieve better profits for the contractor. Issues faced among the Bumiputra contractors includes difficulty in getting building materials at affordable prices, inability to fully understand location decisions, demand planning, forecasting, contract negotiations, dynamic pricing, supplier selection, strategic outsourcing, inventory forecasting and network optimization are often highlighted in newspapers and also in academic articles[2–8]. However, few studies have been carried out on assessing and modelling risks associated

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within the context of construction supply chain network of Malaysian Bumiputra contractors. The aim of this paper is to analyse the challenges faced among Bumiputra contractors and the implementation of supply chain management among them.

## 2. Literature Review

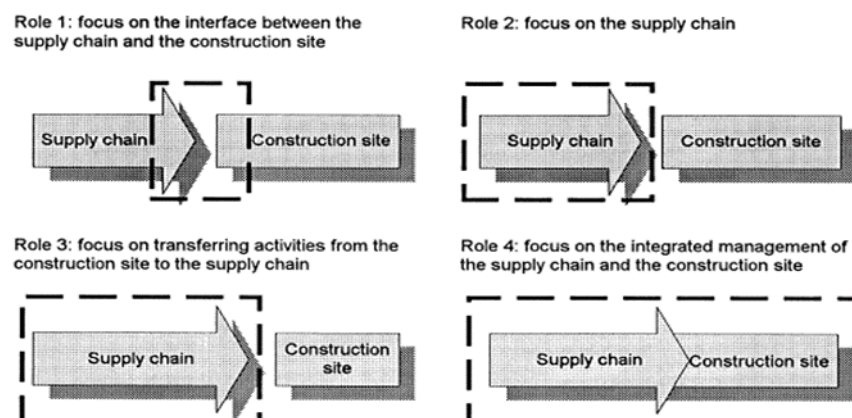
The following sections describe the construction supply chain (CSC) concept and risk management in the construction supply chain.

### 2.1. Concept of supply chain in construction

According to Muya M, Price ADF (1999), three types of supply chains exist, namely 1) the main supply chain which supplies the materials included into the final construction product; 2) the supply chain providing construction-facilitating equipment, skills and materials; and 3) the supply chain for human resources, where supply is involved. Therefore, in construction, the main task is to incorporate supplier and sub-contractor resources into the entire business effectiveness of the supply chain and to organize the relationships between project managers or customers. potentially. According to Vrijhoef, R and Koskela, L (2000), in terms of structure and function, the construction supply chain can be characterised by the following elements:

- The converging supply chain is guided to the building site where the product is constructed from input materials. Unlike production systems, where multiple products pass through the factory and are distributed to a number of customers, the "construction factory" is set up around a single product.
- It is a temporary supply chain, apart from rare exceptions, that produces one construction project via the repeated reconfiguration of project organisations. The supply chain of the construction is thus defined by volatility, confusion and, in general, the division between design and construction.
- It is a traditional supply chain of make-to-order, with each plan creating a new product or model. There's a little overlap, with minor exceptions again. Nonetheless, the method can be very different for a specific type of project.

The characteristics discussed above have an impact on the management of supply chains. Four major roles of SCM in construction are depicted in Figure 1.



**Figure 1.** The four roles of supply chain management in construction [10]

The focus may be on the negative impacts of on-site activities on the supply chain. The goal is to reduce site behaviour costs and duration. The primary consideration in this situation is to maintain secure product and labour movements to the site in order to prevent process interruption. This can be

achieved simply by focusing on the site's relationship with direct suppliers. The contractor whose main interest is in site operation, is in the best position to concentrate on this. The focus may be on the supply chain itself, with the objective of reducing costs, particularly those related to logistics, lead time and inventory. Suppliers of products and parts may also reflect on this. The emphasis may be on the transition of operations from the site to earlier supply chain points. This reason may be simply to avoid the essentially weaker on-site conditions or to achieve greater competitiveness among operations, which is not feasible with the design of the site with its many technological dependencies. The goal is to reduce the overall cost and length once again. This focus may be initiated by suppliers or contractors. The emphasis may be on unified supply chain management or site development enhancement. The development of the site is therefore subsumed into SCM. This may be done by clients, manufacturers and contractors.

It should be noted that the roles as identified above are not mutually exclusive, but are often used jointly. The focus here is on the supply chain of the main contractor. However, there is a fifth important role that lies in the management of the construction supply chain by facility, or real estate owners. They may well drive the management and development of the construction supply chain on which they are reliant for the continuation of their business, for instance when they exploit a number of facilities that need frequent new development and refurbishment.

### *2.2. Risk Management in Construction Supply Chain*

Differences of the type, size, duration, diversity, player and location would contribute to the risk-exposure of the construction industry. The purpose is to create a framework, to support decision-makers to handle the risks efficiently and successfully. In Malaysia, risk management has been implemented since the early 1990s [11]. However, not all companies have established their own risk management departments. Moreover, due to insufficiency of relevant data, most of the Malaysian construction firms still do not apply risk management in their construction projects [12]. According to Siang & Ali (2019) revealed that construction project in Malaysia mostly do not use risk management techniques and only small group of construction professional implement risk management in their project. Nevertheless, risk management is applicable to most construction companies in their programs but only in small sizes [14]. By applying the supply chain management to the risk management, construction companies can benefit significantly, including reduced real costs, margin maintenance, incentive for waste removal, competitive advantages, increased safety of cost output, better customer value, on-time delivery, improved productivity, value creation and repetitive activities.

## **3. Methodology**

Therefore, the information presented in this paper is based primarily on a thorough review of the relevant literature within the context of supply chain management. Wisconsin (2008) described a literature review as a "critical analysis of a portion of a written body of knowledge by summing up, classifying, and contrasting previous research findings, literature reviews, and conceptual papers." There are six literature review components that include a database, a quest, a questionnaire, a learning tool, a facilitator for study, and a document. The literature review discusses, categorizes and illustrates the meaning, theory, context, implementation and related issues of supply chain management in the construction industry. All the details and information collected directly from the scanned repository from archives, papers, books, and other printed materials. This literature review will thus reveal the risk factors that will lead to Bumiputra contractors' performance in either winning the work or completing the contracts won. The ultimate goal of this on-going study is to create a model for supply chain risk management for the Bumiputera contractors.

## **4. Result and Discussion**

To maintain their company, the contractor Bumiputra must fulfil customer demand, incorporate the content, data and capital flows under information management assistance and handle them interactively between consumers, vendors, subcontractors or other participants. The typical challenges

faced by contractors from Bumiputera from 9 reference sites in previous studies are presented in Table 1 and 2 [2, 4–7, 10, 15–17]. Table 1 outlined 32 problems for the inner Bumiputera contractor. It can be further categorized into five factors: coordination, management decisions, exchange of data, scheduling of activity, financial and personnel. Whereas Table 2 shows 12 specific threats, including financial, social, technical, business and natural hazards, among the Bumiputra contractors, from the external source, which can be further divided by 5 factors. It is predicted that Bumiputra contractors will survive and develop their company in the construction industry if the difficulties underlined were addressed by risk management in the supply chain.

**Table 1.** Major Risk Factors Associated with Types of Internal

<i>INTERNAL RISKS</i>
<p><b>Cooperative risk</b></p> <ol style="list-style-type: none"> <li>1. Missing teamwork between parties [2] [4] [10]</li> <li>2. Conflict of contractors with other [2] [4]</li> <li>3. During the construction phase, adjustments to requirements and specifications. [2] [4]</li> <li>4. False documents, revisions in model, extended time for design adjustments and authorisation, fake measurements models which do not adhere to the most common construction methods, no buildability [4] [15]</li> </ol>
<p><b>Management decision risk</b></p> <ol style="list-style-type: none"> <li>1. Failure to know to address the issue [4]</li> <li>2. Difficulty to handle construction projects under creative skill [4]</li> <li>3. Lack of building know-how and skills [4]</li> <li>4. The client needs an opportunity and a new project [4]</li> <li>5. Good reputation on the basis of the previous record of work [4]</li> <li>6. Planning and management inefficiency [4] [5] [10]</li> <li>7. Lack of technical tendering [4] [15]</li> </ol>
<p><b>Operational schedule risk</b></p> <ol style="list-style-type: none"> <li>1. Machinery and building material neglect [4]</li> <li>2. The logistic study not sufficient, roads not efficient, permits not obtained and licenses not needed, delays to customs clearance [4]</li> <li>3. Lengthy storage time [4] [10]</li> <li>4. Large shipments, inappropriate packaging, poor weather or political conditions Long space time, multi-sub-contractor interfaces and vendors [4] [10]</li> <li>5. Unresolved reliability and technological issues have been delayed due to early implementation [4]</li> </ol>
<p><b>Human resource risk</b></p> <ol style="list-style-type: none"> <li>1. A weakness of local construction workers [2] [4]</li> <li>2. Difficulty in getting skilled workers [2] [4] [5]</li> <li>3. Low productivity of several subcontractors, poor worker training, poor communication and transfers of information, difficulty in getting skilled workers [2] [4]</li> </ol>
<p><b>Financial risk</b></p> <ol style="list-style-type: none"> <li>1. Challenge to get a reasonable price for equipment [2] [4]</li> <li>2. Unable to handle financially [2] [4] [5]</li> <li>3. Attempt to start a new venture with monetary capital [2] [4]</li> <li>4. There is inadequate cash flow for construction [2] [4]</li> <li>5. Cash flow failure to prosecute [2] [4] [6] [15]</li> <li>6. Construction material hard to purchase [2] [4]</li> <li>7. Construction product variations price [2] [4]</li> <li>8. Plan forecasts wrong and unreliable [2] [4]</li> <li>9. Securing a bank loan challenge [2] [4] [5] [15]</li> <li>10. Slow fee for progress [2] [4]</li> </ol>
<p><b>Information sharing risk</b></p> <ol style="list-style-type: none"> <li>1. Lack of skill in conversation [2] [16]</li> <li>2. In the contract specification, drawing and layout, lacking instruction and data [10] [15] [16]</li> <li>3. Most suppliers lack teamwork, communication and dedication [4] [16]</li> </ol>

**Table 2.** Major Risk Factors Associated with Types of External

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**EXTERNAL RISKS**

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**Politic risk**

1. Dependent on government allocated Project [4] [15] [17]
2. Change of Policy [4] [15] [16] [17]
3. Change of Government [4] [16] [17]

**Economic risk**

1. Change of Exchange Rate [4] [16] [17]
2. Change of trade volume [4] [16] [17]

**Technology risk**

1. Lack of knowledge and expertise on a new approach to technology [2] [17]
2. Technology update [4] [16] [17]

**Natural hazard risk**

1. The bad condition of site [4] [5] [15] [16]
2. The plant's destruction [4] [16]
3. Geo dislocation [4] [15] [16]

**Market risk**

1. New trend in the business [4] [16]
2. Changing in market [4] [16]

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## 5. Conclusion

Based on the findings from the extensive literature review, some of the Bumiputra contractors are aware of risk management from related trainings attended. To some extent, some of them have even practice risk management in their organisations. This reflects a positive indicator that there is awareness and initiatives among Bumiputra contractors albeit of its small scale on the implementation of risk management in their operations despite of the challenges which emerges from both internal and external source. The most of challenge highlighted based from the literature review is from cooperation, management decision, information sharing, operation schedule, financial, human resource, politic, economic, technology, market and natural hazard. The aforementioned challenges can affect the Bumiputra contractors from either productivity, performance, quality, time schedule and the project budget aspect. Finding from this extensive literature review will be used in developing the model supply chain risk management for Bumiputera contractors to sustain and enhance their business performance in order to compete with other contractors in Malaysia.

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