

# AN IMPROVED RESIN SUPPLY CHAIN FRAMEWORK FOR MALAYSIA AUTOMOTIVE INDUSTRY – CASE STUDY OF A FOREIGN CAR MAKER

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**ABSTRACT. Objective:** The purpose of this paper is to investigate the current resin supply chain model of a foreign car maker in Malaysia by studying the resin supply chain of Company A. A conceptual model is proposed for the improvement of current resin supply chain model of Company A.

**Methodology:** A case study of Company A supply chain model is observed and analysed based on quality, cost and delivery (QCD) process. A conceptual framework is proposed to Company A on achieving target cost.

**Results:** The proposed frameworks established for enhancing the current resin supply chain model.

**Implication:** This research presents a conceptual resin supply chain framework to describe the significance of current supply chain model against the improved supply chain model. The study is particularly useful for foreign car manufacturer mainly Japanese car makers to identify the advantages of improved supply chain model on achieving better costing for localisation. This paper gives valuable reference to Japanese car makers to consider the adoption of conceptual supply chain model in Malaysian automotive industry.

**Keywords:** *Supply chain framework, localization, Malaysian automotive industry & resin.*

**JEL classification:** F60; F63

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## Introduction

Recent decade has witnessed a plethora of research examining the characteristics of first-tier suppliers and the nature of buyer-supplier relationships within a number of geographic and commercial contexts (Ford, 1998; Lamming, 1988, 1994; Sako, 1992, 1999; Hines, 1996; Langfield-Smith and Greenwood, 1998; Correa and Miranda, 1998; Spekman et al., 1998). The most common traditional view which has dominated the automotive sector is that “first-tier” suppliers deliver discrete components to their customer(s) – the original equipment manufacturer (OEM) – and in so doing able to manage that part of the supply chain that provides services and parts for its product.

Lee, Ik-Whan, & Severance (2007) in their research tested the relationship among supply chain performance and supply chain linkages. Their study developed a multivariate regression model for identifying the determinants and characteristics of linkages in the supply chain stakeholder which are suppliers, customers, and internal stakeholders. The study found that for the cost containment an internal integration gives significant contribution while a best supply chain performance is achieved through integration with the supplier. A strategy of economic order quantity provides a good contribution toward cost management. Orders are managed in faster and easy way through economic order quantity system, and the it gained customer reliability. A broad supply chain operation is the best way of collaborating with the supplier and managing the customers. At the same time, a favorable environment is created through internal integration which provides good access to the inventory information systems. The study concluded that a relationship between supply chain performance and supply chain linkages develop a better supply chain system in an organization. More over, the study provides some reliable and valid measurement instruments which practitioners, as well as academicians, use in the measurement of supply chain performance.

This conceptual model which is to develop a specific resin supplier through the localisation activities is incorporated with global resin supply chain models. Thus, the reduction is greater towards cost management. The reduction of logistics cost and local sourcing are the contribution to this studies. Incorporating localisation activities towards Company A resin supply chain would provide great impact not only in term of cost management, as well as technology transfer apart from local economics growth for Malaysian resin supplier.

### **Literature Review**

Towill, Chiderhouse & Disney (2018) in their study analyzes that the supply chain of the real world is different both concerning standard performance as well as the effective action necessary for the world-class supply of automotive products. This study assesses the 20 supply chains from the automotive industry from European countries by using a “quick scan” audit method. The sample taken was not a true representation of the sample because it did not use a random selection procedure, but provide a picture of the overall health of the automotive industry. The study concluded with the output which explains clear portrayal of the supply chain’s health status. It is also found that 10 percent of the performing supply chain provide best practices at the present day level, moreover further 20 percents within sight of this goal. Some specific re-engineering requirements are found in the other remote gaining 70 percent which show’s maturity level at present. In this case, the “quick scan” audit method is applied to specific resin supplier in Malaysia and to develop them together in order to meet Japan’s global resin standard. Discussion and explanation from Japan’s Research and Development (R&D) team is important as it will guide local resin supplier.

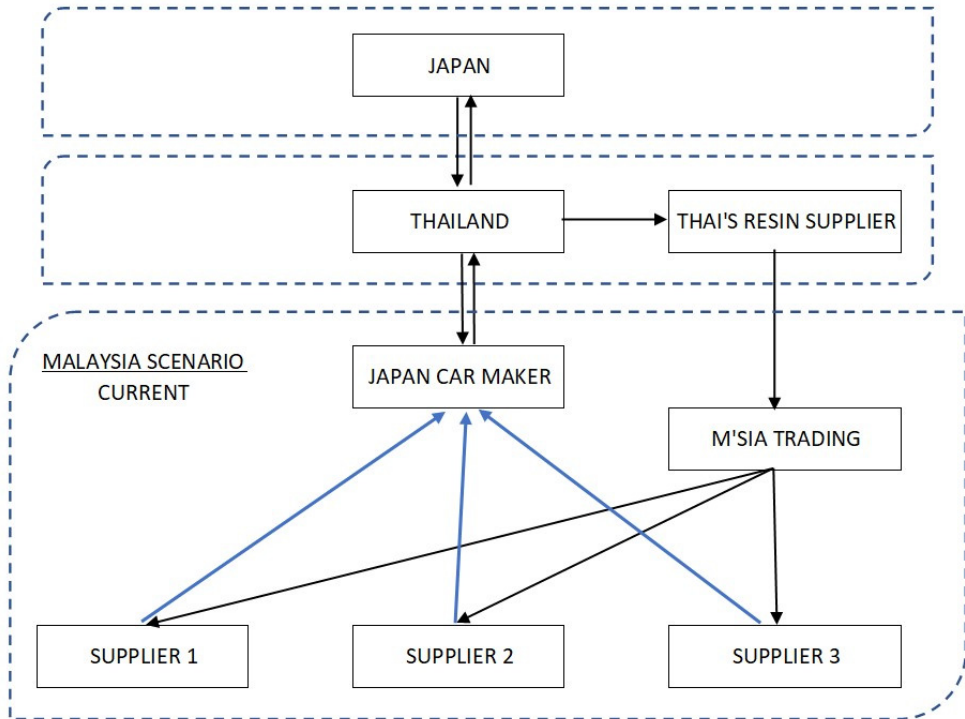
Vanichchinchai (2014) focused on supply chain management practices (SCMP) level, firm’s supply performance (FSP) and total quality management practices (TQMP). His study focus on Thailand’s automotive industry in which he investigated the differences in organizational characteristics on TQMP, SCMP, and FSP. His study based on the analysis of prior studies which measures the three instruments which are TQMP, SCMP, and FSP. These three instruments validated the pilot test, experts tests and used other statistical techniques. In Thailand automotive

industry the material and information flow at operational level decrease the transaction cost. Japanese companies, first-tier companies, and suppliers and large companies tend to apply the TQMP and SCMP intensively and also achieve a high level of FSP.

Thus, it is crucial for Japanese car makers to review their current SCMP and apply it to the Malaysian market. A new framework of supply chain will be required for the improvement particularly in the resin supply chain. Application of TQMP and FSP will be another instruments for further improvement upon implementation of the new resin supply chain framework.

Rugraff (2012) identified sources of competitive advantages. The study explains that an exit behavioral model and an efficient voice articulation model lead to the competitive advantage for the automobile manufacturing industry. An analytical framework is developed for this study for the global chain value studies and analyze the combination of relational linkages, hierarchy and market linkages which lead to the better supply chain management system. As a global player in an automotive industries, the Japanese car maker should develop an analytical framework for their resin supply chain which lead to better resin supply chain management system.

Johri and Petison (2008) analyzed the strategies of local firms and its effect on the performance of international companies subsidiaries in the automobile industry in Thailand. The localisation strategies analyzed by using a case research approach of seven big companies (Hino, Isuzu, Toyota, DaimlerChrysler, Auto Alliance, BMW, and Honda). Against the thinking about the International organizations which implement the strategy of localization to match their needs according to the local environment, this study finds that implementation of localisation strategies by MNE's aim to achieve multiple benefits. The objective focuses on the nine major areas of localisation which are localisation of research and development (R&D); local human resources deployment; exploiting and building the local knowledge pool; strategic decision making of localisation; using networks of local suppliers; localisation of products; manufacturing processes adaptations; localisation of corporate image and deployment of subsidiary profit at local level. These strategies of localisation are not because of the "cost-based localisation" but mainly focus on the "value based localisation."



Source: Authors' compilation

**Figure 1.** Flowchart of the current supply chain model

In the case of Malaysian automotive industry for the foreign car maker especially the Japanese car maker, the resin was develop and manufactured in Thailand. Thailand is the main hub for Japanese car maker in south east asian region due to the government policies and it competitively low labour cost. Thus, the resin which already develop in Thailand will be handled by the appointed trading agent for local distribution of the resin in Malaysia. Company A will inform their Thailand plant the forecast volume required by the Malaysia plant for production and the resin will be handle by the trading agent for deliveries. Figure 1 shows the flowchart of the current supply chain model which being used by Company A. base on the observation of this case study, others Japanese car maker follows the same supply chain

model for their Malaysian production plant. There is no specific supply chain framework for the Japanese car maker for their resin supply. Thus, Figure 1 was developed based on the observation for the current resin supply chain framework.

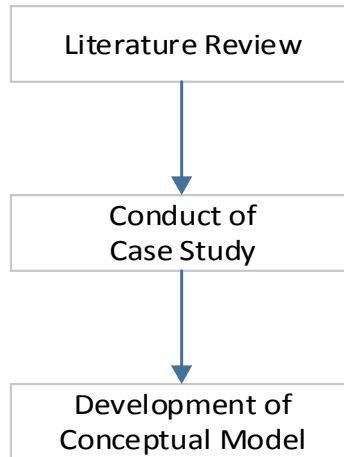
### **Methodology**

An observation of Company A current resin supply chain framework was analyzed after reviewing from some literature. The development of the Company A resin supply chain framework will be based on qualitative case study approach. Various data sources is used for qualitative case study investigation of phenomenon. Stake (1995), and Yin (2003, 2009a) discussed about two approaches that guide case study methodology. Both by Yin (2003) and Stake (1995) case studies applied the naturalist theory. Constructivists asserted the reality is comparative and is based on a person's view and judgement. The involvement of researcher as well as the participant will benefit the alliance and partnership. Thus, the participants tend to inform and share their experience (Crabtree and Miller, 2002). Reality views and perspective will be described by the participants of the matters being studied. Hence, the researcher is able to learn and increase the knowledge of the participants' action and ways of doing things (Lather, 1992).

Yin (2009) suggested that exploratory studies have the goal of developing hypothesis and propositions for further inquiry. Case study method helps the researcher to assess and examine persons or organizations using the following facts and characteristics: multifaceted, interventions on what to be observed, associations, groups (population) or programs (Yin, 2003). He also had pointed out that case study design should be used in the following situations: (1) emphasis on answering what and how type of questions; (2) the participants' behaviour cannot be manipulated; (3) the contextual conditions should be covered when involved in the aspect under study; and (4) the precincts extents are not apparently visible between the context and the aspect (or phenomenon).

Case study methods produces a variety of outcomes which is not the same as controlled experiments. Case studies offer insightful knowledge of the subject being studied (Runeson and Höst, 2008). Zainal (2007)

defined the design, categories, advantages, and disadvantages of case studies. Case study can be conducted in single or multiple modes. The drawback of a single-case design is its inability to provide a general conclusion. In this case, a conceptual model of an improve resin supply chain is develop base on case study design. According to Yin (2003) a case studies are divided into exploratory, explanatory, and descriptive. The differences among single, holistic and multiple case studies are also determined. Figure 2 shows the research methodology approach used for the development of the conceptual model for Malaysian resin supply chain framework.



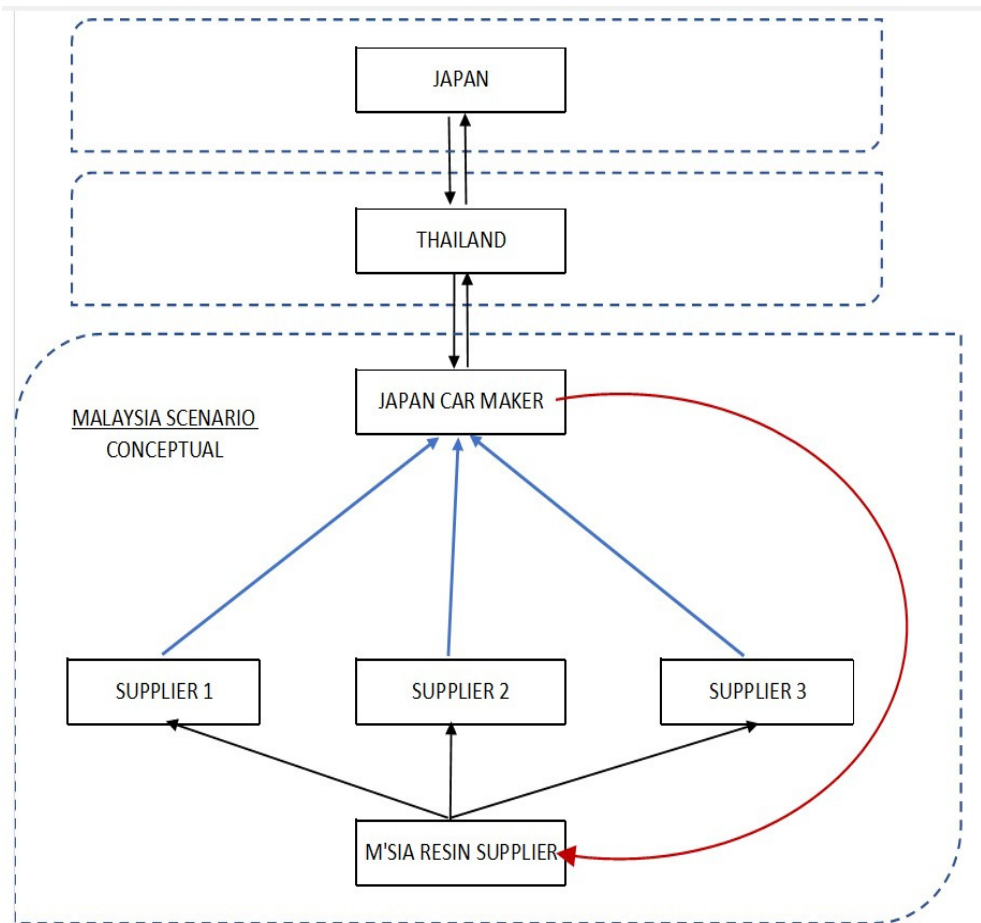
*Source: Authors' compilation*

**Figure 2.** Research methodology

### **Conceptual framework for resin supply chain.**

Company A needs to join and develop with the local resin manufacturers or suppliers to meet their resin standards which refers to Japanese standard. Initially, the resin supplier will be competing on the cost prior qualifying to the next round. The development of the resin in order to meet the resin specification and target cost is based on the resin supplier knowledge. The resin needs to comply with the basic test

requirement prior complying to the full specifications. The resin has to meet the specification prior supplying to Company A. The R&D team based in Thailand will verify the resin quality by conducting the same testing when they developed with the Thailand resin supplier initially. The material has to undergo the lengthy process of development which also include the product testing depending on the resin classification and application. The resin testing must satisfy the Japanese requirement for every specific resin standard.



Source: Authors' compilations

**Figure 3.** Conceptual model of resin supply chain framework for Honda Malaysia Sdn. Bhd. (HMSB)



Upon approval of Japan R&D team together with Thailand R&D team, the resin will be ready to be used by Malaysian vendors or supplier to Company A. In the event of short supply of the resin in Malaysia, the Thailand resin supplier will always there to support for the demand and vice versa. Figure 3 shows the conceptual model of resin supply chain framework for Company A. This conceptual framework will have to be validated by Company A in order to be implemented for Malaysian usage as it has some commercial issue with current resin trading agent. The agent might not be able to supply to Malaysian market since Malaysia already have its own resin supplier. The acceptance of the resin supply chain framework is very much depending on Company A itself considering all the advantages in Quality, Cost, Delivery (QCD) which is described earlier.

### **Conclusions and Future Research**

The conceptual model of resin supply chain framework for foreign car maker develop for Company A will be very useful to others Japanese foreign car makers in Malaysia to benchmark such as Nissan, Mazda, Toyota to name a few. The Japanese car makers' concept of resin supply chain differs from continental car makers which using Complete Knock Down (CKD) parts. Japanese car makers mostly produce the plastics parts locally. The conceptual supply chain model would significantly improve in term of better logistics timing, good quality control, continuous supply ability, resin supply consistencies, resin standard changeability, low resin inventories, lower risk and ultimately resin cost reduction. Resilient supply chain management practices, have a positive significant impact on operational performance in terms of delivery flexibility, product quality and customer service in addition to economic performance in terms of reduced costs of procurement, inventory and manufacturing. The next stage of the research involves the expansion of the conceptual model to others foreign car makers. This will hopefully be useful to other manufacturer to join effort with their suppliers in their quest for excellence in order to maintain stability and continuous growth in the competitive automotive industries in Malaysia.

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