

Global Supply Chain Capabilities in Malaysian Textile and Apparel Industry

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Abstract— In today's dynamic business environment, the competition is no more between firms; however, between supply chains to gain competitive advantages. This leads to global supply chain. In the global supply chains, the potential of global supply chain capabilities for growth is very promising. Despite the incredible expansion of the industry, particularly Malaysian textile and apparel supply chain, there has been relatively a handful academic study that looked specifically in the area of global supply chain capabilities and performance. This resulting in very little attention has been paid to the power of global supply chain capabilities by researchers and practitioners. This study is derived from the concept of resource based view in supply chain management. This study aims to investigate the relationship between global supply chain capabilities and supply chain performance in Malaysian textile and apparel industry. By thorough reviewing the supply chain management literatures, this study found that there is a relationship between global supply chain capabilities, namely relational capability, technological capability, and organizational culture capability, and supply chain performance. From the underpinning theory and thorough literature review of the study area, this study provides a unique theoretical framework intended to aid researchers and practitioners to develop a more comprehensive understanding of the linkages between global supply chain capabilities and supply chain performance.

Keywords— *Global supply chain capabilities, relational capability, technological capability, organizational culture capability, supply chain performance, textile and apparel industry in Malaysia*

1. Introduction

The textile and apparel industry is one of the fastest-growing industries in Malaysia. This industry has been great potential to be researched, since it has been recognized by the Third Industrial Master Plan for further advancement, and it has the highest forecast of annual growth of export, which is 7.80% per annum [1]. Besides, it has been identified by the Department of Statistics Malaysia [2] reported that textile, and apparel has contributed 1.70% to the growth of Gross Domestic

Product (GDP) on manufacturing sector in 2012. This indicates the industry's potential to be researched primarily because of its contribution to Malaysia's GDP. Today's textile and apparel's fashion marketplace are characterized by dynamic competition and short life cycles, tremendous product variety [3], high volatility [4], low predictability [5], high impulse purchasing [6], unclear market boundaries, non-linear direction [7], and an enormous number of finished product codes [4]. Therefore, the competitive fashion supply chain systems are characterized by three critical lead times, which is, time to market, time to serve, and time to respond [6]. This industry supports both upstream and downstream of the supply chain. This industry is highly fragmented with small and medium-sized enterprises (SMEs) [4], [8]. Hong Kong textile and apparel supply chain is faced the similar situation as described by Hunter and Valention [9] and Lam and Postle [5]. Therefore, the developed and developing countries such as Malaysia have placed specific attention on the development of SMEs [10], since it has contributed to the country in terms of resource utilizations, employment opportunities, and economic development. In general, the textile and apparel industry faces several problems in its operation. Some of the most critical issues faced by textile and apparel companies worldwide are related to inventory management, supply chains agility and flexibility, supply chain costs, responsiveness, reliability, and asset management.

Global supply chain capabilities are the solution to all above stated issues. It deals with the application of the capabilities in supply chain management to aiding practitioners to well-organized and improving business operations [11]. The potent of global supply chain capabilities has led to extensive studies in manufacturing industry. The complexity, volatile, and dynamic of textile and apparel supply chain has made the studies of global supply chain capabilities more challenges [12], [13]. Textile and apparel companies in Malaysia are facing the same situation. However, there is relatively handful academic studies available on global supply chain capabilities in the industry. This leads to a number of queries on global supply chain capabilities in Malaysia. Does Malaysian textile and apparel companies possess global supply chain capabilities? What is the extent of

global supply chain capabilities possess by textile and apparel companies in Malaysia? What is the effect of global supply chain capabilities on supply chain performance in Malaysian textile and apparel companies? In the overall, this study aims to understand the effect of global supply chain capabilities on supply chain performance in textile and apparel companies in Malaysia.

2. Literature Review

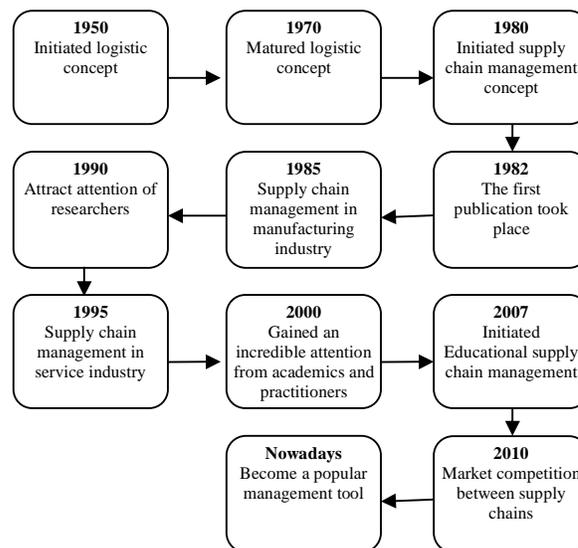
This section provided evidence and proofs to support and strengthen the discussions of this study. The most recent conceptual study by Lee, Udin, and Hassan [14] stated that supply chain capabilities had a huge impact on the supply chain performance of textile and apparel industry in Malaysia. Further on the study of Lee et al. [14], this study will enable the industry to better focus their global supply chain capabilities on their supply chain management in order to achieve higher supply chain performance.

2.1 Supply Chain Management

The concept of supply chain management is originally derived from the logistical concept since 1950 and matured in 1970 [15]. The logistical concept is slowly evolving into the supply chain management concept and initiated the supply chain management concept since 1980, and the first publication took place in 1982 [15]. The concept of supply chain management started to emerge in the manufacturing industry since 1985 [15]. It has attracted attention of researchers since 1990 [16], [17]. This is followed by the service industry initiated the supply chain management in their business operations in 1995 [15]. The development and continuing evolution of the supply chain management role are obvious in the last decade, which gained an incredible attention from both academics and practitioner's community since 2000 [18]. This has led the supply chain management to enter the education industry since 2007 [15]. Nowadays, supply chain management becomes a popular management tool in helping firms improve their competitiveness. The evolution of supply chain management is illustrated in Figure 1.

Over the last 30 years, the significance of supply chain performance on the organization has been indicated in literature [19]. Several studies supported that firm should emphasize supply chain performance due to its huge direct effect on organizational performance [20]–[22]. This is because the current business trend tends to a global market. Therefore, supply chain management is critically importance for the firm to become multi-national [23]. Following the trend, the business competition is no more between firms, however, between supply chains [20]. Hence, this increases the complexity of the supply chain. Supply chain management is based on a complete chain,

which necessitates the involvement of all partners in the chains to hold the key of competitiveness [7]. The concept of supply chain management has proven to be vitally important for textile and apparel industry [5]. In supply chain management, relational capability and technological capability, and organizational culture capability are important global supply chain capabilities in getting better performance as discussed in literature review sections.



Source: Adapted from Habib and Jungthirapanich [15]

Figure 1. The evolution of supply chain management

2.2 Textile and Apparel Supply Chain in Malaysia

Textile and apparel are basic consumption items in both developed and developing countries. The developing countries such as China, India, Vietnam, and Cambodia have gained cost advantage of low wage rates labours. Malaysia no longer provides low wage rate labours with the emergence of China and Indochina. However, Malaysia managed to sustain the operation even with the economic slowdown in 2009 [24]. This is because Malaysia is recognized as an international standard for its quality, reliability, and prompt delivery. In Malaysia, the textile and apparel sector has extensive experience as a producer of the world known brands such as Brooks Brothers, Ralph, Kohl's, Calvin Klein, Alain Delon, Gucci, Polo, Lauren, Adidas, Nike, Yves St Laurent, Walt Disney, Reebok, Puma, GAP, Oshkosh, Burberry, Ashworth, etc. [25]. Basically, most of the Malaysian made textile and apparel are exported to Canada, United States, Turkey, and Europe, while, the major import markets of Malaysia are China, Taiwan, and Japan [25].

MATRADE (2013) noted that there are three textile and apparel industry associations in Malaysia, which is Malaysian Textile Manufacturers Association (MTMA), Malaysian Garment Manufacturers Association (MGMA),

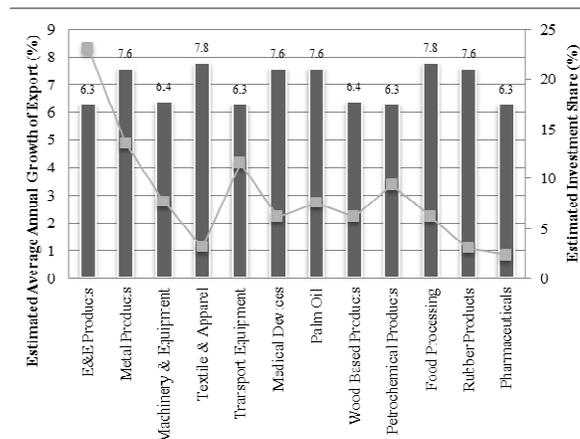
and Malaysian Knitting Manufacturers Association (MKMA). In recent years, textiles and apparel industry has covered a board range of activities. MATRADE [26], classified the structure of Malaysian textile and apparel industry into two main sectors, which is upstream and downstream. In the initial stage, upstream consists of the activities before the manufacturing of textile or apparel such as fibre, yarn, fabric, wet, spinning, knitting, weaving, dying, printing, silk screening, and embroidery processing activities, while downstream consists of the activities after the manufacturing of apparel, textile products, home textiles, and clothing accessories. Malaysian made textile and apparel are illustrated in Table 1 as follows.

Table 1. Made in Malaysia's Textile and Apparel Goods

Textiles	Apparels
Fibres	Jackets
Yarns (cotton yarn, CVC yarn, polyester/ cotton yarn, polyester/ rayon yarn, spun polyester yarn, texturized nylon yarn, polyester filament yarn, acrylic yarn, acrylic/ wool blended yarn, worsted and woolen yarn, cotton coarse yarn)	Overcoats
Special yarns, textile fabrics and related products	Skirts
Woven cotton fabrics	T-shirts
Fabrics woven of man-made textile materials	Blouses
Knitted or crocheted fabrics	Pants Undergarments
Tulles, lace, embroidery, ribbons, trimmings and other small wares	Scarves
Floor coverings (carpets and rugs)	Handkerchiefs
Home textiles (bed linen, table linen, towels)	Headgear (caps and hats)
Industrial textiles (ropes, cords, car seat fabrics, geo-textiles, dryer fabrics and press belt)	Textile accessories (zippers, buttons, sewing thread, industrial thread, embroidery thread, drawstrings, labels, laces, embroidered articles, collars, cuffs, hooks and eyes, tape, polyester padding, interlining, Velcro tape, cotton tape and narrow fabric)

Source: Adopted from MATRADE directory [28]

In the Third Industrial Master Plan (IMP3) [1], textiles and apparel industry has been identified for further development. This is based on their potential to expand further and contribute at a higher level to the growth of export in the manufacturing sector. Figure 2 illustrates the comparison between percentages of estimated average annual growth of exports and estimated investment share for the twelve targeted manufacturing industries. The textiles and apparel industry possesses the highest forecast of annual growth of export, which is 7.80% per annum, while the lowest in estimated investment share for the period of 2006 to 2020. This means that textile and apparel industry has been potential for growth in the future.



Source: Adopted from IMP3 [1]

Figure 2. Comparison between the estimated percentage of exports averages annual growth and investment share among twelve selected industry.

2.3 Supply Chain Performance

Supply chain performance is looking for the intra-organizational and inter-organizational performance, while organizational performance is purely looking for the intra-organizational or single organization performance [29]. Nowadays, business completion is switched to between supply chains rather than among organizations. Thus, supply chain performance has increasingly received special attention by practitioners [30]–[32]. Practitioners used performance measurement to quantify the efficiency and effectiveness of the activities taken by the companies” [33], [34]. Efficiency is used to define internal performance, while effectiveness is used to define external performance [35]. Performance efficiency and effectiveness in the modern supply chains are vitally important for firms to survive in global competitive market [36].

The old adage “you cannot improve what you are not measuring” is certainly factual for individual, organization, and supply chains as well (Tan *et al.*, 2002). Thus, an organization must be able to create a performance measurement system that consistent with the goal in supply chain management to achieve business distinction [23], [38]. There are several approaches often used to measure supply chain performance, including game theory, fuzzy theory, balance scorecards, ARIMA model, supply chain operations reference (SCOR) model, and theory of constraints thinking are well accepted [32], [39]. Among them, SCOR model received approximately 70% of the world’s leading manufacturing companies applied for their performance evaluation [40]. SCOR model is the first cross industry framework to evaluate and improve organization’s supply chain performance [41], [42]. It has five key performance attribute, including

reliability, responsiveness, agility, cost containment, and asset management [42].

2.4 Global Supply Chain Capabilities

The capability study is not new in the academic study [43], [44], but global supply chain capability is potential to be researched. This is because global supply chain capabilities play an important role for firms to improve their supply chain performance [45]. Relational capability, technological capability, and organizational culture capability are important supply chain capabilities as discussed in the following sections.

2.4.1 Relational Capability

Basically, relational capability can be defined as the property of two or more data files that can be shared or exchanged for viewing, editing, or transforming to become useful information. Information sharing is the way of communication with members of the supply chain [46]. During information sharing, the role of information quality is crucially important, since it serves as the foundation for a company to make informed decisions [47]. The significance of the relationship between customer relationship and supplier partnership in supply chain management has been recognized for many centuries [48]. Partnership is the core of the connection between suppliers and customers. The good relationship with customer and supplier can improve manufacturing and supply chain performance [49]. In this context, one of the pre-requisites for a strong supplier partnership is based on the level of shared information. Thus, the emphasis on upstream and downstream flows of material and information is notable. As Tseng, Wu, and Nguyen (2011) suggested, firms should obtain data from various fields to become competitive.

2.4.2 Technological Capability

Information technology (IT) utilization is widely recognized as a foundation of success in supply chain management and an essential approach to improved supply chain performance [51]–[53]. The development of IT has significantly contributed to the change in firm's structures, processes, and relationship with trading firms. However, numerous companies lack of IT knowledge and IT skills [54]. Hence, such companies require investments in human and social capital to fully utilize the IT applications [55]. The resource based view of IT recommends that the IT resources in the firm can be the competitive capability of the firm. Bharadwaj (2000) pointed out that firm's human IT skills, IT infrastructure, and IT re-configurability are firm's inimitable resources. Every single IT resource is unique and complex to

acquire. The combination of single IT resources creates a firm's potent capability [56].

In a globalized market, IT has become a necessary application of business functions to be competitive. Although it is complex and requires great investment of time and finances [4], [57], the reward is considerably high [58] if the right technology is applied in the right firm and in a timely manner [59]. Many large organizations that are conglomerations of business units and acquisitions across the globe [60] have taken years to integrate the supply chain system [61]–[63]. Unfortunately, the huge initial investment and risk largely restrict vendors to be competitive in global distribution and multinational business [50]. However, the investment might run up millions of dollars. Therefore, large organizations might have enough resources and budgets to adopt, but it would be a burden or a challenge for small and medium enterprises (SME) since they have limited resources [4], [64]. Indirectly, it would be the burden or challenge for textile and apparel companies in Malaysia, since most of them are small and medium-sized [4], [8].

2.4.3 Organizational Culture Capability

In general, culture can be defined as the combination of the language, behaviours, beliefs, rituals, rules, institutions, and practices that characterize a society [65]. While, organizational culture can be generally defined as a set of behaviour of humans that work in an organization in which affects the way people, and groups interact with each other [66]. The ability of employees is the key to success of an organization. The ways of the employees working are playing an important role in operating the business of the organization. Thus, the top management of an organization must hire the right people for the right position, since every employee has their own abilities and talents.

2.5 Global Supply Chain Capabilities and Supply Chain Performance

In the past, businesses focused only on internal improvement and reduced waste, but nowadays, businesses are focusing on the external improvement of the firm to become more efficient. Therefore, continuous improvements on internal and external operations are necessary for continuous supply chain performance improvement. As a Socio-Economic and Environment Research Institute [25] noted that low labour cost was crucial for textile and apparel organization, but other factors are, likewise, significant. Those factors are included relational capability, technological capability, and organizational culture capability.

According to Campo, Rubio, and Yague [67], greater extents of information sharing lead to higher potential performance in supply chain management, while, greater

extents of information quality lead to higher performance in supply chain management. This means that both information sharing and information quality are important for firms to improve their supply chain performance. There are many studies revealed that information sharing with supply chain members significantly impacts on supply chain performance [30], [61], [68]–[74]. By having information sharing, the firm has been increasing potential to improve its performance. Furthermore, one of the keys to achieving the agile response to market's uncertainty is to depend on the supplier partnership to provide quality material and flexibility in supply [75]. The good relationship with the customer is crucially important in achieving an understanding their requirements and expectations [75]. These actions enable organizations to sustain their competitive advantage in the dynamic markets.

The primary goal of technological capabilities in supply chain management is to seamlessly connect the point of production to the point of procurement and delivery. In recent decades, technologies are extensively known as being critical success factors in the supply chain management due to their ability to improve individual organization and supply chain performance [76]. This is one of the approaches for firms to directly access international markets as a boundless business [36] to sustain competitive advantage [18]. In today's market, IT application has created a very powerful distribution network in achieving customers' satisfaction, which is capable of finding everything under one roof such as fresh products, consumer products, apparel, and electronic products [77]. Besides, technological capability's applications are popular, and it has been proven that they are capable of strengthen the weaknesses of the supply chain, enhance operating reliability, reduce operating costs, increase responsiveness [78], increase agility [47], improving services, enhancing the supply chain partnership [79], allowing a direct links to suppliers or customers [80], reducing production lead time, and minimizing the inventory level [32].

In an organization, organizational culture can be considered as a critical factor in improving performance of organization or supply chain. The culture of employees worked in an organization has a significant impact on supply chain performance [81]. This effect is supported by several researchers in which the work culture or behaviour of employees improved supply chain performance in terms of speed [82], flexibility [49], supply chain costs [83], order fulfilment [84], and on-time delivery [84]. This means that the good and positive organizational culture can improve supply chain performance. Thus, the organization should give benefits or rewards to the employees who have achieved high performance to maintain or improve the behaviour and practices.

2.6 Resource Based View Theory

The focused of this study are global supply chain capabilities and supply chain performance of textile and apparel industry in Malaysia. Resource based view (RBV) is the underpinning theory for this study. Thus, it provides an important guide for this study. In this study, relational capability, technological capability, and organizational culture capability would be the resources and capabilities that used to improve the supply chain performance in Malaysian textile and apparel industry [85]–[90].

2.7 Theoretical Framework

Based on the discussion on previous sections, this section narrowed down the discussion of literature review to form a theoretical framework for this study as illustrated in Figure 2. The theoretical framework showed the linkages between the variables that undertaken in this study. Specifically, global supply chain capabilities, namely, relational capability, technological capability, and organizational culture capability are the independent variables, and supply chain performance is the dependent variable in this study.

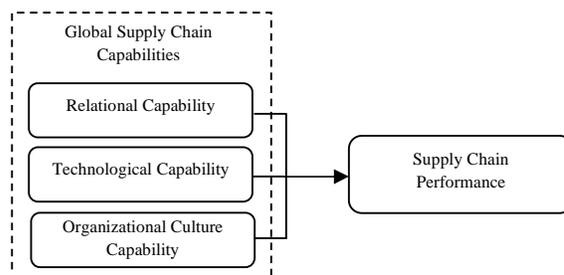


Figure 3. Theoretical framework

2.8 Proposition

The link between global supply chain capabilities and supply chain performance has been clearly discussed and explained in literature review and theoretical framework. Thus, based on the discussion on the aforementioned, the following research propositions are proposed.

- RP1. The higher the global supply chain capabilities, the higher will be the supply chain performance.
- RP1_a. The higher the relational capability, the higher will be the supply chain performance.
- RP1_b. The higher the technological capability, the higher will be the supply chain performance.
- RP1_c. The higher the organizational culture capability, the higher will be the supply chain performance.

3. Methodology

This study focused on textile and apparel industry in Malaysia. Therefore, there is a strong possibility that understanding the textiles and apparel industry will provide supply chain insights to the members of complete textile and apparel supply chain, including supplier, manufacturer, distributor, retailer, service provider, and customer in Malaysia. Therefore, the population of this study will be 423 organizations, which cover the Malaysian textile and apparel suppliers, manufacturers, distributors, retailers, service providers, and customers listed on the Federation of Malaysian Manufacturers (FMM) directory [8] and Malaysia External Trade Development Corporation (MATRADE) directory [28]. Specifically, the targeted respondents are supply chain, planning, and procurement managers (some organizations called them as buyer, purchasing or customer service managers whose are direct deals with buyer, supplier, and inventory control) to give a response on the present study. Based on Krejcie and Morgan's sampling table, the sample size for this study is 201 organizations [91], [92]. Thus, the organization will be the unit of measure of this study. The simple random sampling technique will be chosen to determine the sample because of its accuracy and accessibility [93], [94], least biasness and offers the most generalizability [95].

In social science study, there are three major research paradigms, which are quantitative, qualitative, and mixed method research design [96]. While, mixed method research designs can be divided into six types, including convergent parallel, explanatory sequential, exploratory sequential, embedded, transformative, and multiphase design [97]. This study proposed to apply explanatory sequential mixed method's research design in conducting the research. The procedure of conduct explanatory sequential mixed method research is beginning with the development of survey instrument, which is a survey questionnaire. Then, this study will distribute the survey questionnaire to 201 textile and apparel companies to collect quantitative data. In the survey questionnaire, the respondents will ask to answer the simple and convenient 5-point Likert scale questions [98], [99]. Subsequently, the quantitative data will be analysed by structural equation modelling (SEM) which is using SPSS version 20 and AMOS version 16 for data analysis after the completion of quantitative data collection. Based on the quantitative data, the study will select few cases for further study through face to face interview the respondents by the aid of semi-structured questionnaire or interview protocol to get in-depth understanding on the selected cases [100]–[102]. This study proposed three samples for the interview, and it will be chosen from quantitative respondents. This is suggested by Lincoln and Guba [103] and Merriam [104], where there is no rule

of thumb to identify the sample in qualitative studies. The qualitative data will be analysed by ATLAS.ti after the completion of qualitative data collection. In the final stage of explanatory sequential mixed method research design is the integration of quantitative and qualitative results to get a potent conclusion of the study. In a short sentence, qualitative data is used to extensively explain, interpret, understand, and triangulate the results of quantitative analysis [97]. As Zhu [105] suggested, the evaluation method of supply chain performance should focus on the combination of quantitative and qualitative analysis, if not, the possible insights and findings of other methods might be missed.

4. Conclusion

This study was conducted to understand the global supply chain capabilities of textile and apparel industry in Malaysia. The findings from literature reviews revealed that global supply chain capabilities play an important role in improving supply chain performance, such as improved reliability, responsiveness, agility, costs, and asset management in Malaysian textile and apparel companies. Similarly, this study expected to show a strong correlation between global supply chain capabilities and supply chain performance in Malaysian textile and apparel industry. The power of the global supply chain capabilities hinges to a large extent on the ability of the industry to operate more efficiently and effectively towards globally competitive. Thus, Malaysian textile and apparel industry should pay more attention on global supply chain capabilities in improving performance. This study is expected to enhance the body of knowledge on supply chain management and global supply chain capabilities as well as the performance of the supply chain and organizations. This study is an initial step to help industry practitioners to realize the important role played by global supply chain capabilities on supply chain performance.

As mentioned earlier, this study has discussed the global supply chain capabilities in a brief conceptual study. Therefore, further research is advised to target more comprehensively in the empirical study to test and proof the relationship of global supply chain capabilities and supply chain performance in the theoretical framework of this study. This is to empirically test if the framework is practically useful to textile and apparel companies or industry in Malaysia.

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