DETERMINANTS OF EFFECTIVE SUPPLY CHAIN PARTNERING IN THE CONTEXT OF ELECTRICAL AND ELECTRONICS FIRMS IN MALAYSIA

by

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DEDICATION

To my beloved mother A.Kalyanasunthari

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ABSTRAK

Pengurusan rantaian bekalan baru-baru ini diperkenalkan untuk menangani pakatan fungsi-fungsi organisasi bermula dari pemesanan dan penerimaan bahan mentah pada peringkat proses pembuatan hingga ke penyaluran dan penghantaran hasil keluaran kepada pelanggan. Penggunaannya membolehkan organisasi-organisasi mencapai perolehan yang lebih baik, mengurangkan kos operasi dan inventori.

Penyelidikan ini mempunyai tiga objektif utama. Objektif pertama ialah untuk mendapatkan pemahaman mengenai pakatan rantaian bekalan dan untuk meneliti sama ada keberkesanan pakatan rantaian bekalan terpengaruh oleh faktor-faktor penentu seperti infrastruktur rantaian bekalan, pembahagian sumber, aliran maklumat dan pertautan organisasi.

Objektif kedua ialah untuk mengenal pasti faktor-faktor yang paling signifikan yang boleh mempengaruhi keberkesanan pakatan rantaian bekalan. Objektif ketiga ialah untuk meneliti sama ada pakatan diskalakan memberi kesan sederhana di antara hubungan keberkesanan pakatan rantaian bekalan dengan aliran maklumat, pembahagian sumber dan pertautan organisasi.

Disertasi ini meluaskan kajian yang dahulu dalam hubungan rantaian bekalan dan mengenalpasti penyederhana yang mempengaruhi pakatan rantaian bekalan. Penyelidikan ini mengumpulkan maklumat berkenaan dengan pakatan rantaian bekalan dari 129 syarikat-syarikat elektrik dan elektronik dan pengalaman yang terperinci dari 2 buah syarikat elektrik dan elektronik yang berkualiti di Malaysia.

Faktor-faktor yang mempengaruhi keberkesanan pakatan rantaian bekalan dan bagaimana tahap pakatan diskalakan mempengaruhi keberkesanan pakatan rantaian bekalan dikaji. Penemuan-penemuan dari penyelidikan secara pos menunjukkan kepentingan faktor-faktor seperti infrastruktur rantaian bekalan, aliran maklumat,

pertautan organisasi dalam menjelaskan keberkesanan sesebuah syarikat dalam melaksanakan pakatan rantaian bekalan. Analisa statistik menganjurkan bahawa faktor aliran maklumat dan pertautan organasasi adalah faktor yang paling penting dalam mempengaruhi pakatan rantaian bekalan.

Tinjauan kajian kes menghuraikan dengan lebih jelas lagi tentang bagaimana faktor-faktor infrastruktur rantaian bekalan, pembahagian sumber, aliran maklumat dan pertautan organisasi mempengaruhi pakatan rantaian bekalan. Kajian kes juga mendapati bahawa keberkesanan pakatan rantaian bekalan adalah dipengaruhi oleh faktor-faktor pertautan organisasi dan aliran maklumat.

Dengan ini, kajian kes menunjukkan bahawa keberkesanan pakatan rantaian bekalan kurang di dorong oleh pembahagian sumber dan infrastruktur rantaian bekalan. Pakatan diskalakan yang tinggi adalah lebih berkesan berbanding dengan pakatan diskalakan yang rendah bagi semua peringkat pertautan organisasi dan pembahagian sumber dalam mempengaruhi pakatan rantaian bekalan.

Disertasi ini mengemukakan dua pembolehubah yang baru, “pembahagian sumber” dan “pakatan yang diskalakan” bagi meningkatkan keberkesanan pakatan. Hasil yang dijangkakan, sumbangan-sumbangan terhadap serta arah tuju penyelidikan pada masa depan juga terkandung di dalam kajian ini.

ABSTRACT

Supply chain management has been recently introduced to address the partnering of organizational functions ranging from the ordering and receipt of raw materials throughout the manufacturing processes, to the distribution and delivery of products to the customer.

Its application demonstrates that this idea enables organizations to achieve improved procurement, lowered operations cost, and lower inventory. There are three major objectives for this research.

The first objective is to have an understanding of supply chain partnering and to examine whether the effectiveness of supply chain partnering is influenced by factors such as supply chain infrastructure, resource sharing, information flow and organizational linkage. The second objective is to identify a set of the most significant factors that influence the effectiveness of supply chain partnering. The third objective is to examine if scalable partnering moderates the relationship between effectiveness of supply chain partnering with supply chain infrastructure, information flow, resource sharing and organizational linkage.

This dissertation extends the previous work done on the supply chain relationship and identifies a moderator that influences the supply chain partnering. This study brings together information about supply chain partnering from (129) electrical and electronics companies and detailed experiences of the supply chain partnering from 2 leading quality electrical and electronics companies in Malaysia.

Factors which influence the effectiveness of supply chain partnering and how level of scalable partnering influences the effectiveness of supply chain partnering, are examined. The findings from mail survey study indicate the importance of such factors as the supply chain infrastructure, information flow and organizational

linkage, in explaining a company's effectiveness in implementing the supply chain partnering. At a statistical level of investigation, this implicitly suggests that the factor of information flow and organizational linkage are the most important factor, which influences the effectiveness of supply chain partnering.

In the second part of the study, case study survey data is used to shed light on how the factors of supply chain infrastructure, resource sharing, information flow and organizational linkage influence the effectiveness of supply chain partnering. The case studies appear to suggest that the organizational linkage and information flow have the highest explanatory power with regard to companies' effectiveness of supply chain partnering.

Instead, the case study suggests that the effectiveness of supply chain partnering is less driven by resource sharing and supply chain infrastructure. High scalable partnering is more effective than low scalable partnering for all levels of organizational linkage and resource sharing, which influences supply chain partnering. This dissertation presents two new variables, called "resource sharing" and "scalable partnering" to enhance supply chain partnering effectiveness. Expected outcomes and contributions as well as future research are also provided.

CHAPTER 1

INTRODUCTION

1.0 Introduction

Economic forces and technological advances have combined over the past 20 years to increase the importance of the supply chain on company profitability and long-term business success. In the early 1980s, Oliver and Webber (1982) discussed the potential benefits of integrating the internal business functions of purchasing, manufacturing, sales, and distribution. Then, more attention was placed on the concept of supply chain management, which reflected the management of money, material gain and information throughout the supply pipeline.

At present, the great majority of firms have entered a new era in understanding the dynamics of competitive advantage and the role played by supply chain management. They no longer talk about suppliers and customers as though they are managed in isolation, each treated as an independent entity. More and more, firms are witnessing a transformation in which suppliers and customers are inextricably linked throughout the entire sequence of events that brings raw material from its source of supply, through different value-adding activities to the ultimate customer. Moreover, success in the supply chain is no longer measured by a single transaction; it is now considered as the ability to be competitive within an industry. Consequently, Krajewski and Ritzman (2002) have claimed that supply chain management has strategic implications because the supply system can be used to achieve important competitive priorities.

Realizing the importance of the supply chain as a global competitive weapon, the Malaysian government has extended the role and function of the Federation of Malaysian Manufacturers (FMM). FMM is now spearheading the effort to prepare

local industries to compete globally by automating their supply chain management processes (Yong, 2002). Besides this, the government has also allocated a grant of RM5 million to realize the Tiger project[1] goals by enabling manufacturers who are involved in the local electrical and electronic sector to implement RosettaNet, an Internet-based common messaging standard for global supply chain management (further discussed in Chapter 2).

According to Yong (2002), generally there is a supportive environment to the global supply chain in Malaysia. This study, however, provides an attractive argument by pointing out that even when the supportive environment is provided, the effectiveness of the supply chain could still impact firms' supply chain management. Given this situation, the supply chain is an interesting issue to study.

1.1 Research Background

To understand the role and position of the supply chain, the study first discusses the economic concept of the value chain. When describing the supply chain in industrial companies, the value chain of Porter (1985) is taken as a term of reference. Michael Porter (1985), the noted economist and author, identified a systematic means for examining all the activities a firm performs and how those activities interact. According to Porter, the value chain is a tool that disaggregates a firm into its core activities to help reduce costs and identify sources of competitiveness. The concept of supply chain management is actually extending the economic concept of the value chain. The value chain focuses on the internal process of value adding to the product

[1] TIGER stands for Technology + Industry + Government for the e-Economic Revolution of Malaysian businesses, in particular, as a supplier to global buyers. The Tiger Project is the initiative for the electrical and electronics sector and is a collaboration between the Malaysian public and private sectors to roll out secure e-commerce services to manufacturing companies - Tier 1, Tier 2 and including SMEs.

and services on the other hand supply chain management looks beyond the internal process and integrate the upstream and downstream entities.

A basic purpose of supply chain management is to control inventory by managing the flows of materials. Managing the flow of materials is common to firms in every segment of the economy such as governments, manufacturers, retailers, and universities. In essence, manufacturers, make products from materials and services they purchase from outside suppliers. Firms today, however, are relying more than ever on suppliers from around the world. Because materials comprise such a large component of sales dollars, firms can reap large profits with a small percentage reduction in the costs of materials. As mentioned by Kotler and Armstrong (1999), buyers and suppliers engage in a business relationship that happens along the channel in the supply chain. Because exchange brings together multiple buyers and suppliers, buyers can expect to pay lower prices when purchasing through the exchange. That is one reason why supply chain management is a key competitive weapon.

Managing materials in the supply chain involves working with suppliers who provide parts, raw materials, components and services. Foster, Whiteman and Dowling (2002) however, claim that there has been a trend toward developing closer working relationships with fewer suppliers. They further stress that this new approach to suppliers will result in improving suppliers' performance. Several approaches to improve suppliers are actually adopted from quality improvement which focuses on low levels of defects and conforms to requirements. Inspired by the Japanese industry, supplier-partner relationships have emerged and resulted in what is called channel partners or supplier partnering.

The goal of channel partners in the supply chain is to create mutual participation based upon planned collaboration and co-operation. A part of this

relationship truly represents innovative ways of doing things and could be examples as well as benchmark practices for other firms. Hence Andersen and Von Hellens (1997) proposed the use of so-called frame agreements, which are defined as long-term contracts under which one or very few suppliers are defined as preferred suppliers for certain components. They observed a few suppliers' attributes in the chain, which could be a benchmark in many situations for the benefit of others. For example, the supply chain partnering efforts can provide simpler purchasing procedures and eliminate supplier searches while guaranteeing a fixed, or even decreasing, price for defined parts (direct and indirect materials). With this relationship, efficiency programs can be developed to achieve cost reduction, quality improvement, process improvement, and improved product development. In the end, this will lead to the eroding of boundaries among the channel partners.

Dimitris (2001) discussed the importance of supplier partnering in relation to costs and the quality of delivery among the channel partners. He proposed that partners in the channel should integrate their diverse concerns regarding the quality of deliverables and costs, and then integrate them into a common denominator understandable by every business partner for them to develop dependable measurements, evaluate alternatives, and reach decisions. Furthermore, Charu and Sameer (2001) discovered that supply chain management is a major issue in many industries as firms realize the importance of creating a partnership with their suppliers and customers. They also mentioned that progressive firms are focusing on revenue growth instead of merely striving to drive efficiencies by boosting supply-chain visibility to meet annual cost reduction targets. Despite the potential revenue growth, cutting costs and improving the process do not come without management practices and technical challenges.

However, integrating the supply chain is quite difficult because of its dynamics and the conflicting objectives employed by different facilities and partners. Nevertheless, the National Semiconductor, Wal-Mart, and Procter and Gamble success stories demonstrate not only that integrating the supply chain is possible, but also that it can have a huge impact on a company's performance and market share, (Simchi-Levi & Kaminsky, 2000).

The key challenge in supply chain management would be partnering efforts and the various factors that drive these partnering efforts. As little research has been done on the relationship between partnering efforts with the effectiveness of partnering, this study is timely.

1.2 Problem Identification

Management teams across the industry have been making huge investments in supply chain infrastructure and systems and, in many cases, have already significantly improved their services and products. Consequently, most of these firms have progressed well beyond mere incremental gains. The ability to work with closer relationships across the entire supply chain line in a seamless way, however, is required. This is important for integration of the business systems, resources, and capabilities so that business success can be achieved in a win-win situation among the various channel partners.

The supply chain is seen to play a positive role in the growth of business performance because many literature reviews have proved that supply chain principles can improve the competitive position (Ganeshan & Harrison, 1995; Harland, 1996; Anderson, Britt, & Favre, 1997; Spekman, Kamauff & Myhr, 1998; Elliman & Orange, 2000; Jayanth, Vickery & Droge, 2000; Lee, 2000; Christopher & Lee, 2001; Lee, 2001; Lee & Whang, 2001; Muzumdar & Balachandran, 2001; Fynes & Voss,

2002; Lee, 2002, Pyke, & Johnson, 2002). In other words, many studies have often concluded that companies can improve business performance simply by adopting supply chain management. Fynes and Voss (2002), however, stressed that adopting supply chain orientation requires establishing relationships among the channel partners. Consequently, successful partnering with suppliers and buyers is actually important for companies to improve their business performance. This is confirmed by Wong (2002) in his study on "Sustaining company performance through partnering with suppliers". He discovered that one of the roots of success in company performance is that they work closely with the suppliers.

According to Riddalls, Bennett and Tipi (2000), an optimized system does not exist among the channel partners. They noted an example of constraint, the logistics of the production process usually favoring large batch sizes, while supermarkets like to operate very small inventories to minimize costs and retain flexibility. These again show the need to create partnering relationships.

Considering the partnering strategy in the supply chain as a method to improve business performance, there has been considerable analysis of a buyer-seller relationship development in the literature (Bejou & Palmer, 1998). Much of the discussion on partnering, however, focuses on the processes by which relationships are developed. Nonetheless, the subject of partnering practice, such as infrastructure partnering and its building blocks is less well researched and less documented in the literature.

A report by Malaysian American Electronics Industry (MAEI) claims that American electronics firms are eager to raise their local sourcing content by as much as 50 percent after having RM13.6 billion in local sourcing in 2005, (Star Publication, 2006 April). However these efforts are not being able to meet by local suppliers

because of their inability and gaps in supply chain relationship. They often fail to have good visibility in Inventory, react to shorter lead times and cope with uncertainty. Nick Wreden and Marcus Osborne, of Malaysian Institute of Management, (2005) lays out their observation on the interconnected coordination of the flow of materials, information and finance. They visualize supply chain as a series of linkages, like an assembly line, but actually it is a choreographed network of interconnected activities, each dealing with uncertainty, conflicting objectives and resource constraints. They further argued, to realize the vision of a fully integrated and efficient supply chain, partners in a supply chain need to have partnering structure and capability across their channels.

Apart from literature review, interviews (convenient sampling) were conducted in the study on three multinational corporations, in order to further understand the current supply chain management complexicity. The purpose of these interviews was to provide an opportunity not only to conceptualize the supply chain management generally existing in Malaysian firms but also to explore issues of partnering in greater detail and identify unique supply chain partnering practices. Interviews were conducted with leading company manager primarily involved in the supply chain design in their respective organizations (please refer to Table 1.1 for further details). Intel, sharp and RosettaNet were chosen during this stage because of their value leadership in SCM areas. The objective is to literally highlight the importance of SCM and not to make any comparison between MNC and SME. On top on this it is a means of convenient sampling at the initial stage to have an overview of the problem statement.

The managers' views are that supply chain partnering is an important ingredient to the supply chain success and to the ultimate goal of integration that is operating the whole

supply chain as if it were a single organization. They believe that concepts such as partnering have become a part of the vocabulary of logistics, planning, and purchasing managers. While these managers agree on the fundamental building block, they also urge that an overall characteristic of the supply chain partnering framework has not emerged and its practice have yet to be routinized. Based on the totality of the responses, the supply chain philosophy of partnering that is working closely as a team in the channel of supply has become a great issue. Interestingly, this then raises the question of what determine the effectiveness of supply chain partnering.

In addition to this, they claim that the information flow becomes a critical issue in supply chain partnering. Information flow allows the sharing of guarded financial and other operating information to their channel partners who might have and/ or will be their competitors in the market with expectation that their supply chain partners will not abuse the confidential information.

Table 1.1

Respondents Interviewed

Company name	Position
Intel Corporation	Distribution Network Services Manager
Sharp-Roxy Corporation	General Manager
RosettaNet	Director of RosettaNet Malaysia

Earlier discussions were focus on supplier relationship management and customer relationship management and the focus were on the processes by which relationships are developed. In addition to the processes, there could be other elements that determine the effectiveness in relationship between the supply chain partners. To enhance the competitiveness, supply chain partners must gain cooperation from the of upstream and downstream channel partners. The degree of dependence between these

partners will increase if both can establish the building blocks for the partnering. Therefore this study would extend the previous work on supply chain relationship (processes) and looking at partnering as the phenomena. Hence the investigation would be on the determinants of supply chain partnering in the context of Malaysia specifically on electrical and electronic (E&E) industry.

The context of electrical and electronics justified for this study as E&E contributes to 64.1% of Malaysia's manufactured export in 2005, (Ong, 2006). The electrical and electronics industry is Malaysia's leading industrial sector, contributing significantly to the country's manufacturing output, exports and employment. In 2004, gross output of the industry totaled RM183.1 billion (US$48.2 billion), while the industry's exports of electrical and electronics products amounted to RM241.5 billion (US$63.6 billion) or 64.1% of total manufactured exports. The industry created 369,488 jobs opportunities, accounting for 36.6% of total employment in the manufacturing sector (Ong, 2006). Thus, this research would significant contribute to the growing interest in E&E sector.

Together with the company literature review and interviews, a fruitful discussion session was also held with Professor Hau Lee[2]. Initially, he commented on the research which he regarded as an interesting and significant study. His significant contribution was on the moderating factors. He claimed that various studies have been conducted on trust as a moderator for supply chain partnering and proposes to look into the relationship of the channel partners by means of the 3S concept (substitution, scalability and structure) According to Prof. Lee, scalable partnering has a moderating effect on the outcome of supply chain partnering and has to be further explored. The

[2] Professor Hau Lee is a Professor at Stanford University and the Director of the Global Supply Chain Management Forum. He is also called the Supply Chain Guru. The interview with him was conducted on Feb 26, 2004 at Intel, Penang, Malaysia.

study, therefore, has incorporated the suggestion by Prof. Lee to investigate whether or not the scalable partnering can moderate the relationships for effective supply chain partnering.

Prof. Lee stressed that electrical and electronics firms are the firms that have a very high rate of supply chain partnering. To justify Prof. Lee's claim on the types of firms that are most involved with supply chain partnering, a close examination on the relationships of the channel partners among firms has been done. It shows that over years, many firms from the electrical and electronics industry have emerged as most involved with the relationships. This curiosity is further compounded by facts that the electrical and electronics industry has been responding positively to the supply chain, is more global oriented and generally, more technological competent and advanced compared to other industries. It is thus interesting why electrical and electronics firms show a higher involvement in supply chain partnering.

Even though the contribution of supply chain partnering in this industry is not proven, its adoption of supply chain partnering necessitates further research. This study is primarily undertaken to investigate the significant determining factors of supply chain partnering that can be applied in the electrical and electronic firms to increase firms's effectiveness in supply chain partnering.

1.3 Research Questions

This study will be conducted to answer the following research questions:

1. What is effective supply chain partnering?
2. What are the determining factors of effective supply chain partnering in the context of Malaysia?
3. What factors most significantly influence the effectiveness of supply chain partnering in Malaysia?

4. Does scalable partnering moderate the effectiveness of supply chain partnering in the country?

The answer to these questions will provide the insight needed to successfully implement supply chain partnering, enabling supply chain managers to use the supply chain partnering as a competitive weapon in the business world.

1.4 Research Objectives

This study is undertaken with the objective of investigating the effectiveness of supply chain partnering in Malaysian electrical and electronics firms. The study aims to examine the areas of supply chain partnering, its effectiveness and to understand what the determinants of partnering viewed as important by members in the supply chain are and how they affect its effectiveness.

In general, the study will look at the following objectives:

1. To provide some coordination and clarification of existing disparate work in supply chain partnering.
2. To build on the existing research work in the area of supply chain partnering and its determining factors.

Specifically, the study aims to achieve the following:

1. To understand what supply chain partnering is.
2. To examine whether the effectiveness of supply chain partnering is influenced by determining factors such as the supply chain infrastructure, resource sharing, information flow and organizational linkage.
3. To identify a set of the most significant factors that influences the effectiveness of supply chain partnering.
4. To examine if the scalable partnering moderates the relationship between the effectiveness of supply chain partnering vis-à-vis the supply chain

infrastructure, information flow, resource sharing, and organizational linkage.

1.5 Significance of Study

Recently, research on supply chain management has focused on a debate regarding the need for a closer relationship between the customer, supplier and other relevant parties in search of a competitive advantage. There is evidence of benefits accruing to the proponents of closer relationships sometimes called supply partnerships (Laming, Caldwell, Harrison & Phillips, 2001). The earlier studies of supply chain partnering, however, were focused on cases in the United States (Ghobadian, Gallear & Li, 2000; Whipple & Frankel, 2000; Craighead & Laforge, 2002), and Europe (Andersen, Fagerhaug, Randmoel, Schuldmaier & Prenninger, 1999). However very few studies focused on the Asian region (Gilmor, 1999). In the case of Malaysia, for example, there is room for discussion on the supply chain partnering and its effects on business growth as Malaysia is a developing country (Yong, 2002). In other words, there is no evidence of supply chain partnering studies being conducted in the Malaysian context. This present study investigates the effectiveness of supply chain partnering in the context of Malaysian electrical and electronics firms.

1.6 Research Contribution

This study attempts to enrich the current published literature on the following:

1. It contributes to the literature by identifying determinants that make effective supply chain partnering with channel partners and provide empirical support for the supply chain partnering model. The study will propose the partnering determinants that contribute to relationships that

result in effective partnering. Firms should note these partnering efforts in supply chains.

2. This study extends the theory to the partnering efforts by means of the scalable partnering business approach as a type of partnering in the supply chain between the channel partners. The extent to which scalable partnering promotes effective partnering in supply chains should be noted.

This study attempts to disseminate knowledge to the practitioners of supply chains on the following:

1. The study will help to develop a sharable representation of supply chain partnering knowledge for firms operating in Malaysia as well as support the government in its efforts to build capabilities for the local firms to compete globally.
2. Since the study aims to clarify the phenomena of effective supply chain partnering for electrical and electronic firms in Malaysia, it will examine the building blocks for effective supply chain partnering. The study will focus and introduce a *new variable* for supply chain partnering called "resource sharing" which is derived from the introduction of supply chain partnering efforts.
3. The study will also expand on the features of the scalable partnering relationship among the channel partners. A graphical dimension of the relationship using this concept and its impact of partnering will be shared through this study.
4. Lastly, the comprehensive literature review and empirical approach of the study hopes to bridge the gap between recent business practices on the

supply chain measurement called the Supply Chain Operations Reference (SCOR) model.

1.7 Definitions of Terms

To clarify the language of this study, the following definitions have been chosen:

- **The Supply Chain:** The total sequence of business processes, within a single or multiple enterprise environment, that results in a customer demand for a product or service to be satisfied.
- **Supply Chain Management**: The management of material flow, information flow and money flow along the pipeline in a supply chain.
- **Supply Chain Partnering:** The process whereby firms internally and externally agree to work together in a more co-operative fashion while not compromising on their goals.
- **Effectiveness of Supply Chain Partnering:** This refers to time-related performance measures – "cost reduction, improved procurement and inventory reduction" as well as the elements which reflect a release of resources.
- **Determinants**: The term 'determinant' is used to describe prerequisite dimensions that exist both within and outside the firm.
- **Scalable Partnering:** Scalable partnering refers to the ability of the channel partners to expand the scope of conducting business. This is used as a moderator in this research.

1.8 Structure of the Thesis

To provide a general understanding of the study, a brief description of each chapter is given as:

Chapter 1: Introduction

This chapter provides information on why the study is being undertaken background information as well as the objectives and significance of the study.

Chapter 2: The Electrical & Electronics Industry Outlook and Literature Review

An overview of the current situation and attractiveness of the electrical and electronic industry in Malaysia will be reviewed. Its challenges and the government's support on supply chain initiative will also be discussed.

Next, relevant literature regarding the determinants of the effective supply chain partnering will be explored. Hypotheses of the study are generated from the literature review and a theoretical framework is proposed for this study.

Chapter 3: Theoretical Basis and Research Methodology

This chapter describes the techniques used to obtain data and their use is defended.

Chapter 4: Analysis and Findings

The applied statistical tools and their measurement will be discussed in this chapter.

Chapter 5: Discussion on Statistical Findings

A discussion and argument on the statistical findings will be shared in this chapter.

Chapter 6: Case Study Findings

Two cases studies will be presented together with discussions focusing on the independent variables and their extent of usage in the respective firms.

Chapter 7: Implications, Future Research and Summary

In this chapter, theoretical and managerial implications will be presented together with future research and a summary of the study will be provided.

1.9 Summary

In today's highly competitive global marketplace, the pressure on organizations to find new ways to create and deliver value to customers grows ever stronger. There is a growing recognition that through partnering efforts, efficiency and effective management of the supply chain can be achieved. Currently, biggest challenge in the industrial sector is managing the supply chain, especially the extended supply chain. Multiple channel partners are involved in a chain and managing these entities with a formal authority is a difficult process. This research will therefore address the issue of relationship building and keeping the businesses active while continuously measuring the performance.

A detailed investigation of the role of supply chain partnering in Malaysia, in particular in the electrical and electronics firms, will be explored and a framework for this relationship developed as a contribution to the existing body of knowledge.

CHAPTER 2

THE ELECTRICAL & ELECTRONICS INDUSTRY OUTLOOK AND LITERATURE REVIEW

2.0 Introduction

This chapter is organized as follows:

Section 1: The Malaysian electrical and electronics industry. Since the proposed research will be conducted in the Malaysian environment and the electrical and electronic industry is the targeted population, a discussion on the industry outlook and its attractiveness will be discussed. This section is important as motivation for the study to focus only on the electrical and electronics firms. The government's support and RosettaNet's role will also be discussed.

Section 2: The next part of the chapter presents a detailed review of work reported in the literature on supply chain partnering. A review of this and related literature is then discussed, followed by an evaluation of selected studies on supply chain partnering across the world. Before a framework of the study is presented, the effectiveness of supply chain partnering and determinants of its effectiveness are discussed. Related theories, hypotheses and a summary are then presented.

2.1 The Malaysian Electrical and Electronics Industry

The Malaysian economy expanded at the more rapid pace of 5.1% in the third quarter of 2003 from 4.5% in the second quarter (MIDA, 2005). The growth had been broad based, both in terms of expenditure and production components. Stronger economic fundamentals and a comprehensive public sector response to uncertainties in the global economy in the early part of the year enabled the economy to benefit from the more favorable environment in the third quarter. The strong private sector response to

pro-active government ensures and a low interest rate environment equally contributed to the strengthening of the growth momentum.

2.1.1 The Malaysian Economy outlook

The Malaysian economy has performed remarkably well over the years due to the country's political stability, the sound financial and economic policies adopted by the government, and the efficient management of its natural resources which include oil and gas. Even more impressive is the fact that economic growth in Malaysia was achieved within an environment of relatively low inflation. With the outlook for the global economy becoming increasingly optimistic, the Malaysian economy *is* expected to strengthen further in 2004 and real GDP growth is expected to expand by 5% - 6% *(*Economic Report 2004/2005).

The manufacturing sector now accounts for 31.6% of Malaysia's GDP while exports of manufactured goods make up 78.4% of the country's total exports. From being the world's largest producer of rubber and tin, Malaysia is today one of the world's leading exporters of semiconductor devices, computer hard disks, audio and video products and room air-conditioners.

2.1.2 The Malaysian Electrical and Electronic Industry report

Electrical and electronics products accounted for RM189.4 billion or 56.6 % of Malaysia's total exports and remained the largest contributors in 2002. The largest export market for electrical and electronics products was the USA, valued at RM51 billion absorbing 26.9 % of the total electrical and electronics exports. Other major export destinations were Singapore, RM35.9 billion (19%), Japan, RM21.6 billion (11.4%) and the Netherlands, RM11.7 billion (6.2%). In 2005, E &E had 64.1% of

Malaysia's manufactured export and this followed by chemical which accounted for 21.7% (MIDA, 2005).

As one of the leading exporters of electronics in the world, Malaysia markets electronics components and consumer and industrial electronics products. The biggest export item is semiconductor devices used in a diverse range of industries, such as those in the automotive and telecommunications sectors. Malaysia's electrical products comprise household appliances, wires and cables, electrical industrial equipment, dry cells and batteries and other electrical apparatuses and supplies.

As the electrical and electronics industry is obviously the major contributor to the Malaysian economy, focus has to be placed on it to further sharpen the business process and create relationship among its players. This can be achieved though the establishment of supply chain partnering efforts.

2.1.3 Overview of Electrical Firms

The Malaysian economy remains vulnerable. The electrical firms face huge excesses in the areas of their industrial capacity and office vacancy rates in Malaysia. Still, the uncertainties do not seem as complex as those affecting the electrical industry in the US. Although the economy is still recovering, the cycle is maturing. We are slowly working off some of the excesses, and some of the economic indicators critical to electrical firms are beginning to stir. In Malaysia, these firms include JVC Video, Leap Venture, TFP Precision, Wearner Electric, Asahi Industries (M) Sdn. Bhd., Inventec Electric (M) Sdn. Bhd., Ban Seng Lee Electric, 3-Com Technology, Bellcorp Technology etc. A sophisticated range of electrical appliances is manufactured in Malaysia and include the following:

- Air-conditioners, refrigerators, washing machines, vacuum cleaners, electric fans, instant water heaters, rice cookers, blenders, and microwave ovens.
- Wires and cables
- Activated carbon adapters
- Alarm systems and circuit boards
- Conductors, connectors and conduits
- Electrical industrial equipment such as switchgears
- Distribution transformers and electric motors
- Dry cells, automotive batteries, incandescent lamps and fluorescent tubes

Major brands include Panasonic, Sony, Philips, and Samsung. Homegrown brands like MEC, Khind and Pensonic are also making inroads into export markets. Notably, Malaysia is the world's largest exporter of room air-conditioners, which are sold under global brands like National/Panasonic and homegrown brands Topaire and Acson.

2.1.4 Overview of Electronics Firms

The electronics industry in Malaysia has grown to become the largest industry in the manufacturing sector. Malaysia is one of the largest producers and exporters of semiconductors in the world. US firms account for over half of Malaysia's semiconductor production with the rest being produced by Japanese and European companies. Some of the electronic firms in Malaysia are Intel, Motorola, Hitachi, Fairchild, Agilent, JVC, Inventec, Gallant Electronic Company (M) Sdn. Bhd., BCM Electronics, Solectron, Celestica, etc. Their major products are:

- Display boards (Real Time Stock Information), display boards for outdoors (full colour), scoreboards (electronic)

- Communication equipment, electronic toys (learning aids), power supply products, audio products, adapters
- Databank calculators, desktop calculators, electronic cash registers, electronic organisers, hand-held calculators, printing calculators, feature telephones, Mondex telephones, screenphones, smart card payphones, computer videos, telephone answering devices, digital cameras, video conference cameras, game machines for television
- Electronic components, modules, semiconductors, telecommunications equipment

2.1.5 Electrical and Electronics Industry Trends

In 2002, electrical and electronics products accounted for 56.6 % of Malaysia's total exports and 68.6 % of the exports of manufactured products (MIDA, 2003). List below are some of the indices reflecting the global slowdown as stated in MIDA report (2003):

- The production index of electrical and electronics products decreased by 16.5%, with electronics components recording the biggest decline of 20.1%. Nevertheless, the index for electrical products increased by 17.3%.
- Exports of electrical and electronics products declined by 13.8% to RM189.4 billion from RM219.6 billion in 2001, with electronics components and industrial electronics products recording the highest declines of 15.6% and 14.8%, respectively. Nevertheless, there were electrical and non-electrical product increases in household equipment (23.1%), electro-diagnostic apparatus (21.2%), and automatic data processing machines (8.3%).
- Major markets for electrical and electronics exports recorded decreases: in the U.S.A by 13.4%, Singapore (23.6%) and Japan (10.6%). On a positive note,

exports to the People's Republic of China increased by 55.5% to RM7.1 billion from RM4.6 billion in 2002.

- Productivity in the electrical and electronics industry declined by 9.5%. Within the industry, semiconductors and other electronics components recorded the biggest decrease of 11.7%. However, the manufacturing of refrigerating, exhaust, ventilating and air-conditioning machinery grew by 9.2%.

Despite the negative impact of the slowdown, the electrical and electronics industry continue to attract the highest value of total investments (RM10.2 billion or 41%), almost entirely from foreign sources, MIDA report (2003). In 2005, the E&E industry continued to attract high levels of investments and accounted for the largest share of total investments approved and potential employment in the manufacturing sector. In 2005, investments approved amounted to RM13.8 billion in 226 projects, compared with RM8.6 billion in 2004, representing an increase of 60.5 per cent (MIDA report, 2006). This reflect the continued confidence of foreign investors on the long-term growth potential of the industry. A major challenge for Malaysia is to sustain and enhance its competitiveness in the electrical and electronics arena vis-à-vis competition from other lower cost producing countries. Given its limitations, for example, scarcity of labor, the Malaysian electrical and electronics industry must venture into supply chain partnering where it can a develop new competitive advantage. A new area for building up the competitive advantage is to position the country to exploit opportunities and benefit from the trend in partnering. Apart from promoting Malaysia as a manufacturing base for high value-added components, the focus is also on making the country an efficient provider of logistics and supply chain services.

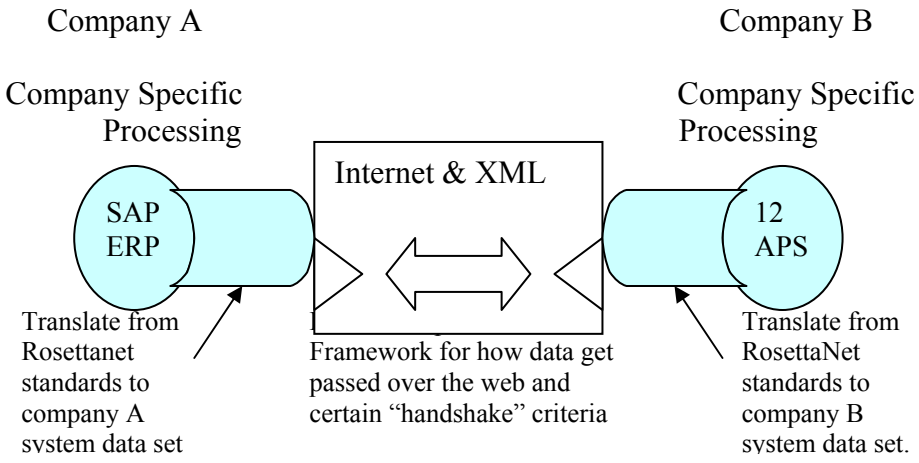
Realizing the challenges ahead, therefore, the Malaysian government planned to position Malaysia as a supply hub for many electrical and electronics components and RosettaNet, an internet-based common messaging system for global supply chain management, has been adopted. The financial assistance of RM5 million has been allocated for companies wishing to participate in the program.

2.2 RosettaNet Malaysia

RosettaNet Malaysia is affiliated to RosettaNet (Global) www.rosettanet.org, a non-profit global organization dedicated to the creation, promotion and proliferation of open e-business process standards worldwide. Currently there are more than 600 companies worldwide in the electronics components (EC), information technology (IT), semiconductor manufacturing (SM) and solutions provider (SP) industries collaborating to develop and support the common standards. Besides RosettaNet Malaysia, there are similar consortiums in USA, Europe, Japan, Korea, Taiwan, Singapore, and the Philippines.

RosettaNet Malaysia was set up in January 2002 as a non-profit organization to promote and facilitate the adoption and implementation of RosettaNet e-business standards amongst MNCs (multinationals) and SMEs (small and medium enterprises) in Malaysia. By implementing the RosettaNet standards, companies will be able communicate electronically with other companies already using the same e-business standards, making business document exchange not only paperless but "touchless", that is, eliminating the need for human intervention. Without the need to reenter data, the processing cycle time is reduced and data entry errors avoided. By adopting RosettaNet standards, companies in Malaysia will not only improve the productivity and quality of their data processing and interchange, but they will be able to e-connect

with the global supply chain. RosettaNet is an open standards system using the Internet superhighway to exchange business information.



Source: RosettaNet Malaysia, 2004. eConnecting Malaysia to the Global Supply Chain.

Figure 2.1 **Partner-to-partner e-business interface**

To enable system to system interface, it is necessary to have a common e-business "language". Figure 2.1 explains the framework and certain "handshake" criteria of how data are passed over the web.

2.2.1 Rosetta Net Grants for the Supply Chain Infrastructure

RosettaNet, the Internet-based supply chain standard launched in January 2002, has started off well with 29 companies and government agencies signing up as members within four months. As of 31 May 2006, 299 companies or businesses have signed up with RosettaNet and RM 2.47 million grant has been approved to 51 local companies in the year 2005 by the government (RosettaNet, 2006).

There are two ways to get companies RosettaNet-enabled. The first method is the one-to-one direct model. Another is to connect via a third party Applications Solution Provider known as the ASP model. The direct model needs a higher initial