LOGISTICS STRATEGIC ORIENTATIONS AND LOGISTICS PERFORMANCE: THE ROLES OF ORGANIZATIONAL STRUCTURE AND LOGISTICS COMPLEXITY

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Once again - **جزاكاللهخيراًكثيراً**

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AH	Authority Hierarchy
ANOVA	Analysis of Variance
CLM	Council of Logistics Management
CN	Centralization
CSCMP	Council of Supply Chain Management Professionals
EPU	Economic Planning Unit
ESC	Expected Shortage per Replenishment Cycle
FM	Formalization
fr	Fill Rate
GDP	Gross Domestic Product
GPN	Global Production Network
ICT	Information and Communication Technology
IMP3	3rd Industrial Master Plan
JIT	Just-in-Time
KLIA	Kuala Lumpur International Airport
KMO	Kaiser-Meyer-Olkin
LAE	Logistics Alignment Effectiveness
LCE	Logistics Coordination Effectiveness
LCO	Logistics Channel Orientation
LE	Logistics Performance
LMCO	Logistics Market & Channel Orientation
LMO	Logistics Market Orientation
LPO	Logistics Process Orientation
LSO	Logistics Strategic Orientations
MIDA	Malaysian Industrial Development Authority
MITI	Ministry of International Trade and Industry
MNCs	Multi-national Companies
MP	Malaysian Plan
MSA	Measure of Sampling Adequacy
NCPDM	National Council of Physical Distribution Management
NLDC	National Logistics Development Council
PN	Participation
Q	Lot Size or Number of Pieces per Order
S&M	Small and Medium
SCM	Supply Chain Management
SJER	Southern Johor Economic Region
SP	Specialization
SPSS	Statistical Package for Social Science
TIPS	Process-related Technological Intricacy
TIPT	Product-related Technological Intricacy
UNC	Logistics Uncertainty
VMS	Vertical Marketing Systems
WPI or IDR	Wilayah Pembangunan Iskandar or Iskandar Development Region
WTO	World Trade Organization

Orientasi strategik logistik dan prestasi logistik: Peranan struktur organisasi dan kekompleksan logistik.

Abstrak

Globalisasi dan liberalisasi sektor perdagangan telah banyak mengubah sifat persaingan hari ini dan telah menjadikan suasana persaingan lebih sengit. Syarikat terpaksa mencari jalan untuk meningkatkan kelebihan daya saing masing-masing untuk terus beroperasi dan membuat keuntungan. Pengurusan rantaian pembekalan secara amya atau logistik khususnya, telah dikenal pasti sebagai satu sumber kelebihan daya saing. Penyelidikan ini telah dijalankan untuk mengenal pasti tahap orientasi strategik logistik, pengaruhnya terhadap prestasi logistik, dan peranan struktur organisasi dan kekompleksan logistik dalam menyederhanakan perhubungan antara orientasi strategik logistik dan prestasi logistik. Data untuk penyelidikan ini telah diperolehi dari 104 firma elektronik di Malaysia. Pelbagai kaedah analisis data telah digunakan untuk menganalisis data seperti ujian perbezaan, analisis kebolehpercayaan, analisis faktor dan analisis regresi berganda. Kajian ini telah mendapati bahawa orientasi strategik firma elektronik (orientasi proses, pasaran dan rangkaian) telah memberikan impak positif ke atas prestasi logistik (keberkesanan penyelarasan dan penjajaran). Kajian ini juga mendapati bahawa beberapa dimensi struktur organisasi seperti darjah pemusatan dan formalisasi adalah lebih efektif dalam melaksanakan sebahagian orientasi strategik logistik dari sebahagian yang lain. Kajian ini juga mendapati bahawa beberapa dimensi kekompleksan logistik seperti ketakpastian logistik dan kompleksiti teknologi telah menyederhanakan perhubungan yang dikaji.

Logistics strategic orientations and logistics performance: the roles of organizational structure and logistics complexity.

Abstract

Globalization and liberalization in the trade sector have changed the nature of competition today and made the environment to become more competitive than ever. Companies are coerced to seek ways to enhance their competitive edge in order to survive and make profit. Supply chain management in general or logistics in particular is identified as a source of competitive edge. This study was conducted to identify the level of logistics strategic orientation, its influence on logistics performance, and the influence of organizational structure and logistics complexity on the relationship between logistics strategic orientation and logistics performance. The data for this study was acquired from 104 electronics firms in Malaysia. Various data-analytic tools have been used to analyze the data such as test of differences, reliability analysis, factor analysis and multiple regression analysis. It was found that the strategic orientation of electronics firms' logistics (process, market and channel orientations) have positively impacted on logistics performance (coordination and alignment effectiveness). It was also found that some dimensions of the organizational structure such as centralization and formalization were more effective in implementing certain dimensions of the strategic orientation than others. It was also found that some dimensions of logistics complexity such as logistics uncertainty and technological intricacy have moderated the said relationship.

CHAPTER 1

INTRODUCTION

1.0 Background

Much of the needs in the economic activities such as raw materials, labour, fuel and markets are never found in one place. Normally, all of these are separated by distances and before any manufacturing process, distribution or any economic activity can take place, the distances need to be overcome first. Apart from that, products have to go through a system that passes certain points during their movements, and these movements need to be managed to ensure efficient flow to consumers. The management of the product flow from the point of origin to the subsequent points and eventually to the end consumer or point of consumption and vice versa is called logistics (Council of Logistics Management, 2003).

The phenomenon of the shrinking world through globalization and the growth of outsourcing has enhanced the role of logistics by allowing processes and product movements from the point of origin to the point of consumption in almost any part of the world (Zacharia & Mentzer, 2004). With the advances of science and technology, these product processes and movements are becoming more efficient and truly globalized, that is no longer restricted to geographical boundaries (Md. Harashid, 2003).

Liberalization in the trade sector, on the other hand, has caused reduced trade constraints and made the manufacturing sector a global one. A more open and global competition necessitates the firms to seek for sources of competitive advantage. A competitive edge normally will not last long and needs to be innovated from time to time. Today's competitive edge will soon be tomorrow's standard requirement. This is where innovation is critical, since it is able to enhance existing competitiveness while new sources of competitive advantage are found. Logistics is seen as one of the promising areas in which competitive advantage can be attained (Bowersox & Daugherty, 1995; Christopher,

1992). Increasingly, more manufacturing firms are setting up operations in multiple locations around the globe, known as global production network (GPN), which necessitates the use of an efficient network of logistics operations to ensure smooth flow of raw materials and products from the point of origin to the point of consumption all over the world (Tracey & Smith-Doerflein, 2001).

The changing management focus on competition from the traditional top-down to the response-based strategy characterised by speed and response, customer orientation, and change and flexibility has also made logistics as one of the most important sources of competitive advantage. Just-in-Time (JIT) manufacturing, shorter product life cycles, product options proliferation, higher product expectations and better customer service level, to name a few, have increased the demand for an effective and efficient logistics in coordinating the product flow. As most successful manufacturing firms are converging in their manufacturing capabilities, this means that the competition in the future is determined by successful management of logistics value chain and time-to-market (Gopal & Cahill, 1992).

The changing nature of competition in the future which is no longer between individual firms but more towards supply chain and supply chain (Christopher, 1992; Hacki & Lighton, 2001) has left firms with no other alternative but to embrace supply chain management approach. The emphasis is on the maximization of customer satisfaction through the optimization of the whole supply chain rather than through the suboptimization of individual members of the supply chain as previously practised. The once adversarial relationships between buyers and suppliers are now gradually changing to be more cooperative (Handfield & Nicholas, 1998), but with more complex relationships along the entire chain. Only those who can harness the complex relationships throughout the entire chain and then link the separate actors together will gain a distinctive advantage (Kanter, 2001).

Logistics is a very important part of operations in a manufacturing firm and one of the most promising areas where productivity advantages such as significant cost saving and value added such as place and time utilities, customer service and satisfaction can be achieved (Christopher, 2001). Manufacturing and logistics typically make up 70.0 percent and 20.0 percent of the total product cost respectively. A RM1 increase in sales does not result in a RM1 increase in profit; however a RM1 saving in logistics costs is a RM1 increased in profit. Thus, logistics cost savings can have greater impact on firm's profitability than increasing sales volume would have (Stock & Lambert, 2001). Similarly, logistics also plays an equally important role in generating value advantage by creating products' place and time utilities. As today's products are facing with an ever shrinking shelf life and higher customer expectations for quality, variety, customization and availability; the ability of logistics particularly in satisfying customers demand for these products at their intended place and time has made logistics as one of firm's potential management tool in improving consumer satisfaction and consequently firm's profit.

1.1 Problem Statement

In today's highly competitive environment, many firms are aiming to gain a share of the global market and to take advantage of higher production and sourcing efficiencies. A key determinant of business performance and a critical factor for competitive advantage nowadays is the role of the logistics in ensuring the smooth flow of materials, products and information throughout a company's supply chain (Bowersox & Closs, 1996; Bowersox & Daugherty, 1995; Christopher, 1992; Sum, Teo and Ng, 2001). Since logistics spans functional boundaries, the coordination and alignment of logistics with other functional areas through value-added activities will help the company to gain a significant competitive advantage, whilst gaining a reduction in operational costs and an improvement in customer service (Christopher, 1989; Richardson, 1995).

As the globalization and competition intensify, so does the role of logistics and transportation in moving goods around the world. In 2005, logistics and transportation had facilitated the movement of world products amounting to US$10.2 trillion or approximately 22.8 percent of world Gross Domestic Product (GDP) (WTO, 2006). In United States for instance, logistics had contributed approximately 10.0 percent to its GDP in 2005 (CSCMP, 2006). In Malaysia, logistics which is broadly catergorized under transport, storage and communication sector; contributed 8.8 percent to the GDP in 2005, and this share is expected to increase to 9.1 percent in 2010 (EPU, 2006). Logistics has facilitated the movement of exported and imported goods worth RM968 billion in 2005 (Department of Statistics, 2006).

The logistics sector is a new and fast growing field in Malaysia. Logistics is playing a crucial role in moving products in and out of the country, thus fuelling the expansion of the economy (EPU, 1996 and 2001). Since the 7th Malaysian Plan, the government has identified logistics as one of the sources of the country's growth and competitiveness. It has contributed significantly to the national economy with much unexplored opportunities considering its infancy in Malaysia (Md. Harashid, 2003). Only recently, for instance, it was proposed in the 3rd Industrial Master Plan (IMP3) that National Logistics Development Council (NLDC) together with its independent research body, namely Supply Chain and Logistics Center, would be established (MITI, 2006). Additionally, newly-built infrastructures such as Kuala Lumpur International Airport (KLIA), sea-air transhipment hub between Port Klang and KLIA, South-west Johor transportation and logistics hub which link Port Tanjung Pelepas and Senai Airport to a new development area known as Southern Johor Economic Region (SJER) which is currently referred to as Wilayah Pembangunan Iskandar (WPI) or Iskandar Development Region (IDR) and other growing special industrial trade zones warrant the need for more managers who are well-versed in logistics management. SJER, for example, has been identified as one of the catalyst and high-impact development under

the Ninth Malaysian Plan (EPU, 2006) which will provide among others a well developed, internationally and internally integrated, strong and efficient logistics system with high level of national and international accessibility and internal mobility; and a strong base for vertically and horizontally integrated dynamic manufacturing and service clusters with well developed external linkages to major regional and global development nodes (Kerajaan Negeri Johor, 2006).

In terms of economic support, the government has introduced wide-ranging economic measures to logistics and distribution sectors. These sectors have been given greater emphasis in the 2003 national budget and later in part of the RM7.3 billion stimulus package, aimed at further enhancing the country's competitiveness, as well as to develop new sources of growth. Under the package, the development of regional distribution centres (RDCs) and international procurement centres (IPCs) are encouraged and various logistics-related tax incentives are given (Jabatan Perbendaharaan Negara, 2003). This will ensure that Malaysia will become a regional transhipment hub. The identification of Malaysia as the third largest outsourcing hub (Kearney Report, 2004) will further challenge the management of logistics in this country.

Unfortunately, little is known about logistics management in Malaysia, especially of each logistics players (suppliers, manufacturers, transportation providers and customers) along the entire supply chain. This is especially true for electronics manufacturers, the main economic contributor, in this country. There are a number of logistics issues pertaining to electronics firms that have been the subject of investigations such as the competitiveness of electronics firms (Md. Zabid & Chacko, 1999), the use of air cargo logistics providers as a competitive advantage in the electronics firms (Hassan, Morshidi and Md. Harashid, 2006) and the use of third party logistics (Sohail & Sohal, 2003). However, there is still a lack of study on the logistics performance (effectiveness) of the numerous logistics players. Even though Hassan *et al.,* (2006) have identified that the coordination effectiveness among

entire logistics players was low, the studies on logistics performance among the logistics players much less within an individual logistics player in general are still lacking. As such, this study will focus on the performance (coordination and alignment effectiveness) of Malaysian electronics firms' logistics and how it contributes to the competitive advantage of the firms. How well logistics is being emphasized to coordinate and align effectively among different functional areas and groups of employees inside as well as outside the firms so as to ensure efficient movement of products from the suppliers to the end customers remains to be seen in this study.

Strategic orientation of a firm's logistics may hold a key in resolving the central issue of logistics performance and making the firm more competitive. In general, strategic orientation is the firm's strategic direction in creating proper behaviour so as to achieve superior performance (Gatignon & Xuereb, 1997). In logistics research, logistics strategic orientation is defined as a philosophy concerning the degree to which an approach or a combination of approaches of process-, market-, and information- or channel-based orientations (Bowersox & Daugherty, 1987) dominates logistics thinking in an organization and consequently the way decisions get made and the way people do their jobs. In this regard, it can be said that logistics strategic orientation is actually the long-term focus that an organization has in its efforts to enhance its logistics performance. As such, logistics orientation can be seen as a potential strategic tool to achieve the end.

How well the logistics performance is achieved may be influenced by the way the logistics strategic orientation is implemented. This means that the organizational structure of a firm may help achieve successful implementation of the pursued logistics strategic orientation. Thus, choosing possible combinations of organizational structure elements such as centralization, formalization and specialization (Robbins, 1990) are expected to play crucial roles in the implementation of the logistics strategic orientation.

However, the logistics strategic orientations-logistics performance relationship may also be influenced by the complexity of the logistics environment within the firm itself. As such, logistics complexity which includes uncertainty in upstream and downstream logistics activities and manufacturing intricacy (Milgate, 2001) is predicted to mitigate the said relationship to a certain extent.

Even though studies had been done on logistics strategic orientation-logistics performance (coordination effectiveness) relationship (Kohn & McGinnis, 1997 and McGinnis & Kohn, 2002), the author is unaware if such a study has been carried out in Malaysia. This study adds a new dimension to logistics performance variable, i.e. alignment effectiveness (order fulfilment effectiveness). Furthermore, gaps as to the roles of organizational structure, and logistics complexity on the relationship have not been addressed in any of the previous studies. It is the intention of this study to fill these gaps. Additionally, most of the previous studies were done on advanced logistics organizations and logistics organizations as compared to this study which will be conducted on electronics firms. It is hoped that the findings will help contribute to a better understanding among the academicians, practitioners of the logistics industry and those interested in the field.

In conclusion, this study explores the influences of logistics strategic orientation on logistics performance and the role of organizational structure on the said relationship under varying degree of logistics complexity, in the electronics firms in Malaysia. The conceptual framework of this study is based on the premise that competitive environment brought by the trade globalisation and liberalization processes have caused the manufacturing sector to respond by configuring the strategic orientation of their firms, operations and production accordingly, especially logistics to enhance their competitiveness. As logistics has a tremendous potential to play a major strategic role in firms, it can be further exploited to allow a firm to gain a competitive advantage (Sum, Teo and Ng, 2001).

In summary, the problem of the research can be stated as follows:

"In the Malaysian context, to what extent does logistics strategic orientation (process, market and channel) have an impact on logistics performance (coordination and alignment effectiveness)? And, what are the roles of organizational structure and logistics complexity on the logistics strategic orientation-logistics performance relationship?"

1.2 Research Objectives

In line with the problem iterated above, the objectives of this research are as follows:

1) To identify the level of logistics strategic orientation pursued by the electronics firms in Malaysia.
2) To identify the influences of logistics strategic orientation on logistics performance.
3) To identify the roles of organizational structure and logistics complexity on logistics strategic orientation-logistics performance relationship.

1.3 Research Questions

Based on the objectives above, the following research questions are formulated:

1) What kind of logistics strategic orientation are the electronics firms in Malaysia pursuing in leveraging their logistics as a source of competitive advantage?
2) What is the relationship between logistics strategic orientation and firm's logistics performance?
3) What kind of organizational structure should be adopted for the logistics strategic orientation pursued so that an optimal logistics performance is achieved?
4) Does logistics complexity play a role in logistics strategic orientation and logistics performance relationship?

1.4 Significance of the Research

This research will contribute, *firstly*, to the performance of logistics as a crucial coordinating mechanism in managing the operations in the electronics firms. The level of emphasis on logistics in the operations will determine the performance of logistics coordination among major functional areas such as purchasing (material procurement), manufacturing and distribution in ensuring smooth movement of input, work-in-process and output materials.

Secondly, this research will shed light on the role of logistics in the strategic management of electronics firms, especially in choosing the right organizational structure to implement the logistics strategic orientation pursued. Additionally, logistics complexity is identified as the new variable that modifies the strategy-structure-performance relationship.

Thirdly, this research will shed light on which dimensions of the logistics strategic orientation are more frequently emphasized by electronics firms in Malaysia.

Fourthly, this research will add to the research knowledge of logistics management in developing countries. The researcher is unaware of any study on the roles of logistics strategic orientation, organizational structure and logistics complexity on logistics effectiveness of electronics firms in Malaysia.

Fifthly, this research will add a new dimension, i.e. alignment effectiveness (order fulfilment effectiveness), to logistics performance variable under study.

Sixthly, this research will identify organizational structure as a moderator in the relationship between logistics strategic orientation and logistics performance.

Seventhly, this research will identify logistics complexity as an internal situational factor that also moderates the relationship between logistics strategic orientation and logistics performance. Hitherto, none of the previous logistics research had studied the impact of organizational structure and logistics complexity on the relationship.

1.5 Research Scope

The electronics firms have been chosen primarily because they form the largest group in the manufacturing sector in terms of their contribution to the national GDP, which is about two-thirds of total manufactured exports (RM283 billion), providing the largest employment opportunities compared to other sectors in the country (EPU, 2006). This industry is playing a significant role in the development of some states in Malaysia, namely Pulau Pinang, Johor and Selangor. Started in the country in the early sixties, the electronics sector today offers investors a ready pool of experienced managers, engineers and technicians who are capable of undertaking overall responsibilities and operating and maintaining equipment used in the manufacture and testing of products (MIDA, 2003). As a global industry, the electronics industry is highly dependent on efficient, effective and reliable logistics management within the firms as well as infrastructure in the countries in which their production facilities are located.

This research focuses on the relationship between logistics strategic orientations and logistics performance of electronics firms in Malaysia. In addition, this research also looks at the impact of the electronics firms' organizational structures as well as the role of logistics complexity on the said relationship.

1.6 Variables Definition

In this section, working definitions of the principal variables will be described briefly. This is to ensure a common understanding of the terms throughout the thesis. A more detail definition will be given in the literature review section. The research variables consist of independent, moderator, and dependent variables.

Dependent Variable: Logistics Performance

Logistics performance is measured by logistics effectiveness which is defined as the degree to which logistics accomplishes its goal, especially in coordinating (Kohn & McGinnis, 1997; McGinnis & Kohn, 2002; Vogt, Pienaar and de Wit, 2002) and aligning (Fisher, 1997; Lambert, Stock and Ellram, 1998) various operating units inter-functionally.

Independent Variable: Logistics Strategic Orientation

Logistics strategic orientation is defined as a philosophy concerning the extent to which process-, market- and channel-based orientations (Bowersox & Daugherty, 1987) dominates the way of thinking in an organization and consequently the way decisions get made and the way people do their jobs.

Moderating Factors: Organizational Structure and Logistics Complexity

Organizational Structure

Organization structure is an official assignment of authority and responsibility for carrying out the organization's goals. Three generic elements of organizational structure, namely centralization, formalization and specialization are studied (Pitts & Lei, 2003; Robbins, 1990).

Centralization

Centralization refers to the degree of concentration of power arrangement (Thompson, 1967), and reflects the locus of decision making with respect to major and specific policies (Reimann, 1974).

Formalization

Formalization is related to the amount of written documentation available in an organization (e.g. rules, procedures and written documentations) which prescribes the rights and activities of employees (Pugh, Hickson, Hinings, MacDonald, Turner *et al*., 1963).

Specialization

Specialization is the degree to which organizational tasks are subdivided into separate jobs. The jobs are broken down into a number of steps, and each step is completed by separate individual (Reimann, 1974) who is best able to perform it.

Logistics Complexity

Logistics complexity is the degree of uncertainty (inherent noise or variations existing in a system) and varying levels and types of interactions present in the system (Wilding, 1998; Johnson & Davis, 1998). Two dimensions of logistics complexity particularly uncertainty and technological intricacy are investigated.

Logistics Uncertainty

Uncertainty refers to the degree of the reliability of a series of sequential and parallel tasks in the downstream and upstream logistics processes (Milgate, 2001).

Technological Intricacy

Technological intricacy refers to the degree of sophistication arising from the number of parts (Clark & Fujimoto, 1991; Funk, 1995; Murmann, 1994) and the process stages involved in producing a manufactured good (Kotha & Orne, 1989; Woodward, 1965).

1.7 Organization of the Remaining Chapters

The thesis will be presented in the following manner. Chapter One consists of the introduction to the research. Chapter Two reviews the related literature on logistics

orientations, logistics performance (coordination and alignment effectiveness), organizational structure and logistics complexity. Chapter Three deliberates on the conceptual framework, hypotheses and research methodology. Chapter Four analyzes the data and presents the findings. Finally, Chapter Five discusses the research findings, conclusions and suggestions for future research.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

Organizations today operate under changing, dynamic and turbulent environment. It is therefore important for them to focus their attention on both the running of day-to-day affairs as well as adapting the organizations to changing environmental conditions so as to be continually effective. Management writers have discussed ways and means to make organizations become more effective and one of the most common is through the strategic management process (Thibodeaux & Favilla, 1996). The ultimate purpose of strategic management is to help organizations enhance performance through improved effectiveness, efficiency and flexibility (Ostroff & Schmitt, 1993) with strategic orientation being one of the most important elements.

Strategic orientation is central to organizational effectiveness (Evered, 1983). It represents the competitive strategy implemented by a firm to create continuing performance improvements. Strategic orientation is actually about how an organization uses strategy to adapt and/or change aspects of its environment for a more favourable alignment (Manu & Sriram, 1996). A large body of strategic orientation literature in strategic management however, contains references to Porter, Miles and Snow's, and to a certain extent to customer, competitive and technological strategic orientations (Gatignon & Xuereb, 1997), with only little attention given to logistics strategic orientation.

Furthermore, unlike the discussion in strategic management and organization theory on the topic of strategic orientation as the competitive strategy, the discussion thread in the logistics management literature on the subject is rather limited. There exists plentiful of unexplored areas especially once the boundaries of logistics are extended to include the

concept of Supply Chain Management (SCM). In addition, logistics also does not have any established theory and thus has been encouraged to borrow from other disciplines (Stock, 1997). In consideration of these impediments, this study draws most of its conceptual foundation from the strategic management and organizational theory literature.

The objective of this research is to ascertain the relationship between logistics strategic orientation and logistics performance in the context of Malaysia. Organizational structure, such as centralization, formalization and specialization, and logistics complexity are also included in the said relationship. Organizational structure and logistics complexity are conceptualized as being contingency factors and hypothetically moderate the relationship between logistics strategic orientation and logistics performance.

This chapter focuses on the literature pertaining to logistics performance, logistics strategic orientation, logistics complexity and organizational structure. The discussion of each will be preceded by the review of the relevant organizational literature and this composition will be so throughout this particular chapter. Additionally, as an effort to ensure coherent understanding of working definitions used throughout the thesis, the definition of logistics management and its relationship with SCM will be explicated first.

2.0.1 Definition of Logistics Management

Logistics management has several definitions. The interesting feature of these definitions is that they change as the researchers and practitioners become more knowledgeable in the field. A case in point is the definition espoused by Council of Logistics Management (CLM) which has changed several times till what it is known today. Even the name of the council itself has also changed recently to what it is now known as Council of Supply Chain Management Professionals (CSCMP) effective January 1st, 2005 (CLM, 2004). CLM's definition of logistics and some other definitions of logistics are as in Table 2.1.

Table 2.1

Definitions of Logistics Management

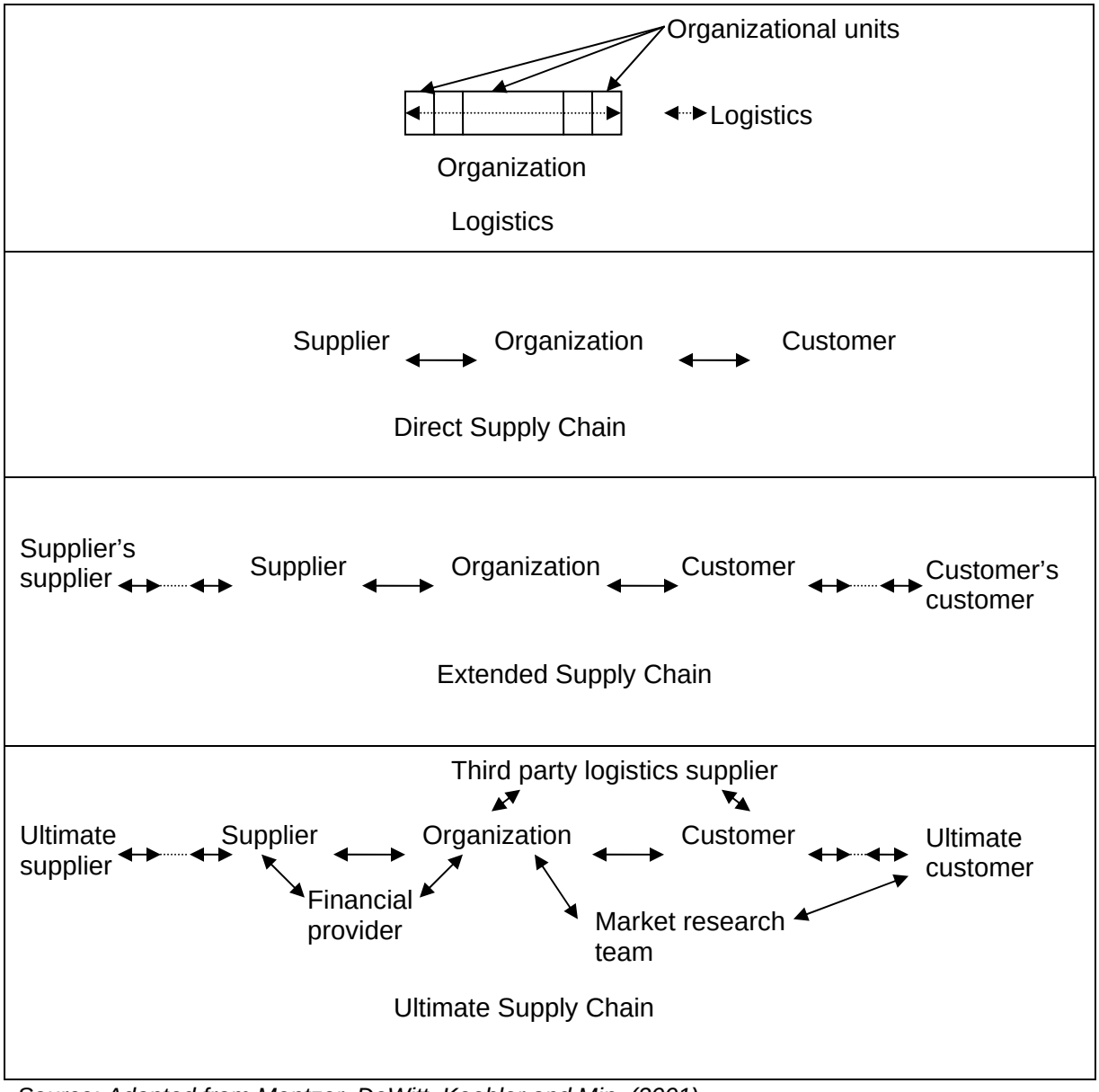
National Council of Physical Distribution Management (NCPDM) (1967)*	"A term employed in manufacturing and commerce to describe the broad range of activities concerned with efficient movement of finished products from the end of the production line to the customer, and in some cases includes the movement of raw materials from the source of supply to the beginning of the production line."
National Council of Physical Distribution Management (NCPDM) (1976)	"The integration of two or more activities for the purpose of planning, implementing, and controlling the efficient flow of raw materials, in-process inventory and finished good from point-of-origin to point-of-consumption."
Council of Logistics Management (CLM) (1985)	"The process of planning, implementing, and controlling the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished goods, and related information from point-of-origin to point-of-consumption for the purpose of conforming to customer requirements"
Council of Logistics Management (CLM) (1992)	"The process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from point-of-origin to point-of-consumption for the purpose of conforming to customer requirements"
Johnson, Wood, Wardlow and Murphy (1999)	"Logistics as the entire process of materials and products moving into, through, and out of a firm."
Coughlin, Anderson, Stern and El-Ansary (2001)	"Logistics has metamorphosed into the concept of SCM, which in turn has come to implicate every element of the value-added chain."
Council of Logistics Management (CLM) (2003)	Logistics is "that part of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements".

Source: Adapted from various sources. * Former name for CLM.

It can be concluded from the definitions above that logistics management concerns with the management of the flow of goods and services within an organization or firm within the supply chain. In other words, logistics management is a subset of supply chain

management, differentiated by the scope of the goods or services movement. This relationship can be clearly depicted in Figure 2.1.

In this study, the definition given by CLM (2003) is used as the working definition since it is the latest and reflective of the current state of understanding in logistics management.



Source: Adapted from Mentzer, DeWitt, Keebler and Min, (2001).

Figure 2.1 Types of channel relationships.

2.0.2 Logistics and Supply Chain Management Relationship

The research on supply chains has its origin in logistics management. The practice of logistics as a formal business management discipline is only a few decades old, and some logistics scholars hold that Drucker (1962) was the one who triggered the evolution of the logistics concept. As late as 1969, Donald Bowersox, the dean of modern logistics management conceded that management science of logistics was still in its infancy (Ross, 2003). The evolution of current interest in logistics can be traced from traffic management and transportation on the one hand, and marketing concepts on the other (Farris, 1997). Practitioners and academics are therefore predominantly interested in the management of material flows and storage of goods (Langley, 1986; LaLonde, 1994).

The evolution of business logistics can be divided into three major phases (Masters & Pohlen, 1994; Kent & Flint, 1997): functional management (1960–1970s), internal integration (1980s), and external integration (1990s) before it entered the fourth phase to what is known today as e-Supply Chain Management (Ross, 2003). Rich and Hines (1998) also have similar descriptions of the first three phases with the only difference in what they termed as the base line organization which focuses more on short-term distribution efficiency, reactive management and cost management. This base line organization can be, in fact, categorized under the first phase.

During the first phase, logistics had two distinct functions: materials management and physical distribution. The former was principally concerned with the flow of materials into the organization, including purchasing, inbound transportation, raw material inventory, and inventory control. The latter was concerned with the movement of finished products from the end of the production line to the customers, including freight, warehousing, materials handling, packaging, and inventory control.

The two functions, then, were integrated into logistics management with a focus on internal integration of the total material flow within the organization. Logistics management in this phase emphasized more on centralizing logistics, managing total cost concept, optimizing operations, increasing customer focus and making logistics as a competitive advantage along with the traditional responsibilities of materials management and physical distribution.

The second phase gave way to the third phase which was characterized by external integration. In this phase, the logistics management did not only focus on materials and information flows within the organization, but also extended the focus to 1st tier suppliers, the downstream customer, and third-party agencies. Globalization, with possibilities for low-cost sourcing and customers spread around the world, required a holistic view of the value network. The explosive development of information and communication technology (ICT) turned out to be the facilitator for further external integration. The term supply chain management arose, to include not only the suppliers' suppliers but also the customers' customers. Some scholars have broadened the supply chain concept to include the general integration of all functions and business processes throughout the total supply chain, including marketing, manufacturing, distribution, etc. (see e.g., Christopher, 1998; Cooper, Lambert & Pagh, 1997; Robeson & Copacino, 1994).

Later, ICT becomes the principal driving force supporting SCM to the fourth phase, which is known as e-Supply Chain Management (e-SCM). In this phase, substantial application of internet technology enables SCM to create a new source of competitive advantage to an organization. By applying e-SCM, an organization is capable of creating new customer value propositions through the architecting of external, internet-enabled collaborative channel partnerships. The management focus in this stage is more towards applying the internet to the SCM concept, low-cost instantaneous sharing of all databases, e-information and SCM synchronization (Ross, 2003).

2.2 Basic Related Theories

Traditionally, two approaches are used in the study of organization, namely sociological and psychological (Miller, Kets de Vries and Toulouse, 1982). Sociological approach stresses on group tendency meaning the organizational behaviour is seen from the structural factors not in the differences between individuals. Conversely, psychological approach perceives behaviours and organizational environment as a personal function and special individual capacity. The former is known as organization theory and the latter as organizational behaviour. Organization theory concerns with a macro examination of the organization while organization behaviour uses micro approach to examine organizations. There is a new approach to the study of organizations called meso theory. Meso means “in between”; meso theory therefore concerns with the mix between organization theory and organization behaviour, i.e. macro and micro level of analysis (Daft, 1998).

This study uses the sociological approach to organization and focuses specifically on the system theory. Two other main theories used in this study which are in fact extensions of the system theory are contingency theory and strategy-structure theory.

System theory is an approach that defined a system as a set of interrelated and interdependent parts arranged in a manner that produces a unified whole (Boulding, 1956; Bertalanffy, 1968). There are two basic types of systems namely closed and open systems.

1) A closed system is one that operates independently from its environment. Frederick Taylor’s machine view of people and organizations is basically a closed system.
2) An open system recognizes the organization as an entity that interacts dynamically with its external environment.

Contingency theory maintains that organization theory must be based on open-systems concept (Woodward, 1965). So, in a sense, contingency view of management has come from the systems concept. Contingency literally means “it depends”, i.e. one thing depends on other thing. This theory states that if the organizations are to be effective, there must be a “goodness of fit” between their internal structures and systems, and the conditions in their environment (Pennings, 1992). What works in a setting may not work in another. There is simply no one best way. The right management approach is contingent upon the organization’s situation. The essence of this approach is that for optimum effectiveness of the organizations, different environments require different organizational relationships.

Strategy-structure theory (Chandler, 1962; Egelhoff, 1988; Franko, 1976; Stopford & Wells, 1972) builds on the foundation of contingency theory. This theory relates to the fit of strategy and structure or getting a right structure for a particular strategy in order to achieve the desired results as stated in the firm objectives. Additionally, this study will use the contingency approach to develop the study conceptual model.

2.3 Logistics Performance (LE)

Measuring logistics performance has been a continuing challenge for all organizations due to its orientation which is process-oriented, multiple output measurements (e.g., order fill, on-time delivery) that are interrelated, the existence of many different organizations in the entire supply chain and the customer perceptions of logistics performance which often times differ from those of the providers.

Organizationally, two generic measures exist to evaluate performance: effectiveness and efficiency (Weele, 1994). Effectiveness is central to the well-being of an organization and an important field of study in organization theory (Goodman & Pennings, 1977). An organization is said to be effective if it reaches or surpasses its objectives over a period of

time (Hitt, Middlemist and Mathis, 1986 and Simon, 1957). In contrast to effectiveness, efficiency is defined as a short-term measure of how well an organization (as a system) uses it resources (Hitt *et al.*, 1986). Efficiency measures the utilization of the resources in the organization that is used to meet the organization's objectives. This study will adopt the concept of effectiveness as a measure to evaluate the logistics performance in the electronics firms. Hence, performance and effectiveness will be used interchangeably. Effectiveness is chosen since it can better capture the boundary-spanning performance of logistics as a system which is essential in maximizing the potential for converting competitive advantage of logistics into profitability (Dyer & Singh, 1998).

2.3.1 Logistics Effectiveness

Traditionally, as in the organization theory, performance measurement is defined as the process of quantifying effectiveness and efficiency of an action (Neely, Gregory and Platts, 1995). There are various ways on how performance is measured, and the most important thing is that it should be able to capture and transfer the complex reality of performance into a sequence of limited symbols that can be communicated and reproduced under similar circumstances (Lebas, 1995). The question is, then, how LE is defined in this study in view of the boundary-spanning nature of logistics processes which cross functional and organizational boundaries.

According to Kahn (1977), to be effective is merely to have effects; the question then is what effects accord with the concept of logistics effectiveness? Basically, there are two underlying approaches to the concept of effectiveness in organization theory, namely external and internal approaches (Cameron, 1980). External approach to organizational effectiveness, the most widely used effectiveness criterion of a goal-attainment model, defines organizational effectiveness as the accomplishment of a set of organizational goals and objectives (Steers, 1975). The internal approach to organizational effectiveness, on the

other hand, is based on a well managed system and competent internal processes. An organization has a well managed system if its members are highly integrated, information flows smoothly, and employees achieve good performance, enjoy job satisfaction and are committed to the organization (Cameron, 1986; Katz & Kahn, 1966; Likert, 1967). There are at least 30 criterion measures of effectiveness found in the literature (Campbell, Dunnette, Lawler and Weick*.,* 1974) out of these approaches, i.e. productivity, efficiency, profit, growth, absenteeism, turnover, job satisfaction and stability to name a few which are in fact a clear manifestation of the differences that exist in the operationalization of the term and the approach/model used (Campbell, 1977).

Given the different conceptualizations of effectiveness in organization theory and the challenge to capture and transfer the complex reality of logistics performance, LE is defined as the degree to which logistics accomplishes its goal, especially in coordinating (Kohn & McGinnis, 1997; McGinnis & Kohn, 2002; Vogt *et al.*, 2002) and aligning (Fisher, 1997; Lambert *et al.*, 1998) various operating units inter-functionally. Thus, the concept of goal-based model of goal-attainment approach through coordination and alignment will be adopted as a measure of LE in this study.

2.3.2 Dimension of Logistics Performance

Two dimensions of LE are conceptualized: coordination and alignment. These two dimensions of logistics performance are chosen to complement each other in terms of the measurement focus: activities and processes, and results (Kueng, 2000). The former is more internally focused, measuring the logistics processes aspect of LE as compared to the latter which is more on external focus measuring the results of the logistics processes themselves. Unfortunately, only a few researchers have tried to develop and test the concept of coordination (Simatupang, Wright and Sridharan, 2002) in supply chain and logistics.

Coordination, the first dimension of LE, refers to the act of managing interdependencies among activities performed to achieve a goal (Malone & Crowston, 1994). This dimension includes the effectiveness of managing interdependencies within organization, among various players of logistics from the suppliers to the customers and between the strategic logistics management to that of the strategic management of an organization (Kohn & McGinnis, 1997). The flow of goods from suppliers to manufacturers and from manufacturers to customers, through effective logistics processes and better working relationships among the departments/units, are crucial so as to achieve optimum customer satisfaction (Langley & Holcomb, 1992). The argument for choosing this dimension of LE goes back to the concept of division of labor in the organization itself. Most organizations today are functionally- not horizontally-oriented. The question of "who I report to" is more dominant than "who I provide value to". The workers in a particular functional silo have little or no coordination at all with other departments/units within the organization, which also means that the esprit de corps is strong within not across the departments/units. Logistics is expected to strengthen the esprit de corps across the functional silos and thereby enhance the logistics coordination effectiveness within the firm.

In addition, the strategic logistics management needs also be coordinated with the firm's strategic management. The coordination signifies the importance of the former to the latter and commitment from the top level of firm's management to the strategic roles of logistics (Bardi, Raghunathan and Bagchi, 1994). Without being recognized as an important element of the firm's strategic orientation and without the strong commitment from the top management, it is hard for logistics to play a significant role in the firm, much less to be leveraged as the firm's competitive advantage. The importance of logistics and the level of the top management commitment are actually reflected in how well logistics strategic planning is incorporated into the strategic management planning, an important component of strategic management processes.