2016

An exploratory study of vendor logistics performance measurement for logistics management in Asia’s apparel industry

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Publication details
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An Exploratory Study of Vendor Logistics Performance Measurement for Logistics Management in Asia’s Apparel Industry

By

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A thesis submitted to the Southern Cross Business School, Southern Cross University, in partial fulfillment of the requirements of the degree of Doctor of Business Administration

July 2015
Declaration

I certify that the work presented in this thesis is, to the best of my knowledge and belief, original, except as acknowledged in the text, and that the material has not been submitted, either in whole or in part, for a degree at this or any other university.

To the best of my knowledge and belief this thesis contains no material which has been published by any other person except where acknowledgement has been made.

Signature : ..........................
Dated : 12 Jul 2015
Candidate : Leo Chi Kong, Law
Abstract

Developing countries in South and South East Asia are becoming more and more important in the global textile and clothing trade. This can be seen from the fact that South and South East Asian countries’ textile and clothing exports to the United States of America have increased in recent years. Some Asia countries include India, Indonesia, Bangladesh, Thailand and Philippines were in the top ten positions of the US clothing importers in 2005. Scholars looking at Asian countries note that they possess plentiful human resources, rapid development in information, communication, knowledge and talent and rapid economic growth. It is not difficult to understand that Asia is becoming an important battlefield for global businesses. With all the potential advantages Asia provides, apparel sourcing will continue to grow in Asia. Customers now have better choices because the gap between supply and demand has decreased and competition has increased. Customers have begun demanding more features and better service. Because of the need to meet rising demand for consumer products, the productivity of an enterprise is no doubt an important performance measure. Good supply chain performance in manufacturing companies is important for achieving competitive advantage. Logistics plays an important strategic role in the supply chain. Logistics management has developed rapidly in recent decades as an essential business management strategy. It is imperative for businesses to develop performance measurement systems in logistics that provide feedback for timely responses, as well as monitoring and enhancement.

This research explores Vendor Logistics Performance and develops a performance measurement tool – the VLPM tool for logistics management to enable Asia’s apparel industry to sustain and enhance organisations’ competitive advantages. A case study research methodology was adopted to address each of the research questions. Participants from three different sectors of Asia’s apparel industry were interviewed. The participants came from a sourcing company, a vendor and a third party logistics service provider. The data obtained were then analysed to show the pattern of the results for each of the four questions and two sub-questions developed in the literature review and also for new
findings that were not planned from the literature review. The research findings were compared with the extant literature to identify the contributions that the research makes to understanding how and why VLPM needs to be developed and how it is of benefit to organisations.

This research contributes to the body of knowledge of logistics management and continuous improvement through the important contribution of VLPM and provides a proposed theoretical model for vendor logistics performance measurement. The study raises questions requiring further research that is of theoretical and practical interest. The study can be a springboard for advocating to practitioners and management executives that they develop a recognised and standardised industrial VLPM tool, since logistics management has already been recognised as an important aspect of organisations’ efforts to sustain and enhance their competitive advantage in the market place. VLPM is an important topic and requires further research.
Acknowledgements

I would like to acknowledge all the people and organisations whose support and assistance made this research possible.

Firstly, I must thank my supervisor Dr Kasey Chang for his patience, advice, guidance, assistance and support for me while I was developing and successfully completing this research.

Secondly, I would like to thank for all the participants in this research who contributed their valuable time to participate in the interviews to share their professional opinions and knowledge.
I also wish to thank Mr. John Revington for his professional editorial advice.

Thirdly, I like to thank my fellow doctoral candidates’ for their encouragement, sharing of ideas and support along the way. Without their friendship, I cannot imagine how I could have finished my study.

Fourthly, I have to thank for the administration and academic staff at Southern Cross University, in particular Professor Ian Eddie, and Miss Betty Yuen at Hong Kong Institute and Technology.

Last and most importantly, I thank my beloved wife Lucy and my daughter Karen for enabling me to have the time to complete the research.
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Chapter 1 – Introduction

1.1 Thesis Outline

Chapter 1 introduces the research topic, An Effective Tool for Logistics Management – Vendor Logistics Performance Measurement (VLPM) for Asia’s apparel industry. It presents the research background, and provides an outline of the research objectives, the research gap and the research questions. The research contributions, and insights into the methodology adopted to address the research questions are also discussed. Figure 1-1 below outlines the sections in this chapter.

1.2 Research Background

This is an exploratory study that develops an effective measurement tool, namely the ‘Vendor Logistics Performance Measurement’ (VLPM) for logistics management in Asia’s apparel industry. The study examines the perspectives of participants from three different sectors: the vendor, the sourcing company and the third party logistics service provider (3PL).

In the apparel industry, garment production involves a high amount of labour (30 per cent to 50 per cent of the final garment cost), which leads apparel producers to search for locations where employee wages are low to reduce production costs (Lin et al., 2002). Therefore, sourcing lower labour-cost production becomes an important strategy for organisations in the global apparel industry (Ettlie & Sethuraman, 2002; Fredriksson & Jonsson, 2009). In the United States, 98 percent of apparel products distributed by leading apparel firms are foreign-made (Ha-Brookshire & Dyer, 2009). Less-developed countries with their lower costs of production have attracted apparel companies.
From 2002 onwards, quotas under the Agreement of Textiles and Clothing (ATC) have been gradually eliminated. Export quotas have been phased out on textiles and clothing products (Chi & Kilduff, 2010). This reflects the fact that textile and clothing exports to the United States from South and South East countries have increased in recent years. Some Asian countries, including India, Indonesia, Bangladesh, Thailand and the Philippines, were in the top ten US clothing importers in 2005 (Tsang & Au, 2008). In particular, China is a winner in the global textile and clothing trade because of its low costs and quality-driven manufacturing base.
Sourcing in Asia is an important strategy for apparel companies to find low-cost production. However, vendor selection and evaluation is critical for sourcing, and any failure could create negative impact to a company’s financial and operational position. Mandal and Deshmukh (1994), by ranking vendor selection criteria, find management and organisational considerations to be the key criteria, particularly of management of transport and communication. Consequently, the research findings indicate that delivery, price and after-sales service are the top three criteria in vendor selection.

Delivery or physical distribution is usually associated with outbound product movements from a firm, but the scope has been broadened to include the movement of raw materials. According to John (1997, p. 274):

> Physical distribution organizations may be defined as organizational units whose duty is to administer economic activities that impact on the flow of finished goods between points of production and consumption.

According to Pollitt (1998), logistics formed an important part of any company’s business strategy in the last quarter of the twentieth century because they expend up to 30 per cent of total costs on distribution of their products.

Customers have better choices when the gap between supply and demand decreases and competition increases. They begin demanding more features and better services. Due to the need to meet the rising demand for consumer products, the productivity of vendors is an important performance measure. Customer demands have propelled companies to innovate and diversify, and in order to grow, businesses have become more complex. The productivity of the vendor has thus become an insufficient measure of business performance. A major international survey indicated that 90 per cent of the respondents in manufacturing companies believe supply chain performance to be important or very important for achieving competitive advantage (Forslund, 2007). A comprehensive logistics reporting system can accurately read the market’s pulse, and this is what excelling in such a dynamic business environment requires (Sun, 1998). A performance
measurement system can provide feedback for timely response, as well as essential monitoring and enhancement (Lambert & Burduroglu, 2000).

The researcher has participated in apparel industries logistics operations management for over 20 years in various organisations. The researcher’s experience includes involvement with the buying offices, manufacturing plants, and the logistics service providers of those organisations. The researcher has held many discussions with apparel market logistics practitioners, and observes that organisations are developing VLPM. However, there is no standardised system within the apparel industry. Furthermore, there has been no worldwide recognised system found. This has aroused the interest of the researcher, and provides the motivation for this study of VLPM.

Amongst the concepts used by organisations to support performance improvements are such concepts as time-to-market; balanced score card; total quality management; business process re-engineering; just-in-time; customer experience; activity based costing and cost management. However, vendor logistics performance is not found to be the major focus in these performance management concepts. In Chapter 2, the functions of each of these concepts will be discussed.

As mentioned, apparel sourcing in Asia has grown dramatically, and has become an imperative business strategy for sourcing companies. The logistics performance of the vendor is one of the top level criteria for vendor selection which is important to the success of sourcing company. No recognised studies in the area of VLPM have been found. Given the existence of this research gap in VLPM, it is important to conduct a study on this topic.

1.3 Research Objective

The topic for this research is to investigate and understand VLPM for the Asian apparel industry. The research focuses on companies’ continuous improvement through VLPM.
Thus, an understanding of the relationships between the industry, the environment, logistics management, logistics activities and their contributions to organisations’ continuous improvement is required. Thus, the research problem can be expressed as:

‘Should organisations develop VLPM, and if so, how should they do so?’

Consequently, the research objective is to explore the application of VLPM and its contributions to organisations’ continuous improvement. The aim is to define VLPM within the context of three different sectors, to understand its significance within Asia’s apparel industry, and to identify what values VLPM contributes to the management and improvement of organisations. This objective can be expressed as follows:

‘To understand the benefits and requirements of Vendor Logistics Performance Measurement for organisations in the apparel industry in Asia.’

To achieve the objective of this study, the researcher studied the extant literature in the areas that relate to the research objective. The problems of research were identified. The researcher then developed a well-structured research methodology, including the research design, data collection and analysis.

With reference to the boundary setting of the research of VLPM, the following related areas were explored:

- development of the apparel industry in Asia
- logistics management as a business strategy
- changes to logistics management strategies to create value
- the key performance index of logistics management and its implications for performance management
- identification of areas of value and potential continuous improvements from measuring the vendors’ logistics performance
The review of the extant literature covering the aforesaid areas in Chapter Two develops a theoretical framework linking VLPM and management of organisations’ continuous improvement. This study was guided by the framework. The literature review and framework led to the development of the following research questions.

1) What is VPLM?
2) Which are the most important criteria for VPLM?
3) What influences the type of VLPM that an organisation requires?
   3.1 How important is it to have specific criteria in the VLPM?
   3.2 How is VLPM shared and reviewed?
4) How important is VLPM for the continuous improvement of an organisation? In what areas does VLPM influence an organisation?

1.4 Justification for the Research

The apparel industry is one of the largest industries in the world, and has a significant economic impact worldwide. The apparel industry is the major industry in some of countries particularly in Asia. Chapter 2 discusses in detail the development of the apparel industry and dramatic growth of sourcing activities in Asia during the last two decades. Apparel vendor selection and evaluation is one of the most critical activities in the industry. In modern management, organisations need to consider many factors when developing a long-term vendor relationships because vendors are regarded as the best intangible assets of any organisation (Mandal and Deshmukh, 1994).

The study of supplier selection and evaluation is not new. There are many empirical studies of actual practice in the literature, and prescriptive studies of how suppliers should be selected (Teng & Jaramillo, 2005; Humphreys et al., 2005; Hsu et al., 2006; Perçin, 2006; Aguezzoul & Ladet, 2007). Different models of vendor selection and evaluation have been suggested such as Interpretive Structural Modelling (ISM) (Mandal
& Deshmukh, 1994), the AHP-PGP model (Perçin, 2006), AHP and Taguchi loss functions (Ordoobadi, 2009a; Ordoobadi & Wang, 2011), and the ANN pruning algorithm-based approach (Li, 2009).

The performance of logistics management in the apparel industry has been identified as an important consideration for sourcing companies in the selection of apparel suppliers or vendors. Studies focusing on VLPM in Asia’s apparel industry are scarce. This study is different from the others on suppliers’ logistic performance measurement in the following major areas:

- It focuses on vendor logistics performance in Asia’s apparel industry
- It provides a comprehensive empirical view that covers three different groups in the apparel industry including sourcing companies, vendors and 3PL inputs instead of only focusing on the buyer’s or customer’s view.
- It is an exploratory study and proposes a performance measurement model with measurement criteria identified for vendor logistics operations in the context of the apparel industry. This model can be used to monitor and provide enhancement information for the continuous improvement of organisations instead of only for vendor selection and evaluation.

1.5 Theoretical and Methodological Approach

This research is an empirical study in the context of vendor logistics performance in Asia’s apparel industry. A phenomenological research paradigm was adopted, given that the study was primarily exploratory in nature (Collis & Hussey, 2003). Also, given that the aim was to study the phenomenon of VLPM in the real business world, qualitative case study methodology was selected (Yin, 2009). In-depth interviews with a set of semi-defined questions were used to collect the primary data to address the knowledge gap emerging from the literature review, which constituted the secondary data.
A digital audio recording device was used to record the research interviews. The research participants were selected from the researcher’s past business network, either executives or experienced logistics practitioners from three different sectors in Asia’s apparel industry. The selected participants were executives and experienced practitioners from multinational companies, all possessing logistics management knowledge and operations experience in Asia. Triangulation was used to test the three different sectors’ sources of data to strip away alternative explanations and prove the hypothesis proposed by the research (Margot, 1991).

Comparative analysis was considered to be the most appropriate data analysis procedure for this study. As explained by Thorne (2000), comparing pieces of data such as themes or statements enables concepts to be built up as similarities and differences between them, and how they relate to each other, are identified.

### 1.6 Research Contributions

Companies aim to achieve continuous improvement by developing value added activities to satisfy customers’ endless demand. This becomes the greatest challenge for managers. Most empirical studies on continuous improvement to logistics performance measurement and supply chain management are based on theory, and are conducted in developed markets. Empirical studies of VLPM focusing on Asia’s apparel industry are scarce. The ultimate objective of this research is to address the gap in knowledge about logistics performance management and organisations’ continuous improvement through the development of VLPM for application in the business environment.

With regard to the contribution of the study to theory, the research results propose the development of VLPM to drive organisations’ continuous improvement. The study attempts to determine the value of VLPM and its application to continuous improvement of companies in Asia’s apparel industry in the context of logistics management. In the broader context, the results of this research can be a springboard for developing a recognised VLPM for the industry. With regard to policy, the research sought to confirm
the importance of developing VLPM as a policy which apparel companies can develop to measure vendor logistics performance and to enhance continuous improvement management.

With regard to practice, the aim of the research was, first, to identify the important criteria and priority of VLPM for Asia’s apparel industry. Secondly, the research investigated what companies need to do in order to develop VLPM. Thirdly, the research examined how and why VLPM needs to be shared and reviewed. Fourthly, the study aimed to identify the areas in which VLPM will support companies’ continuous improvement.

1.7 Thesis Structure

This thesis has a five-chapter format as shown below:

- Chapter 1 - Introduction
- Chapter 2 - Literature Review
- Chapter 3 - Methodology
- Chapter 4 - Data Analysis
- Chapter 5 - Conclusion.

Chapter 1 provides an overview and context of this research. It presents the research background, objectives and the research problems. The contributions to theory, policy and practice are discussed.

Chapter 2 reviews the extant literature from two parent disciplines, the concepts of logistics management and the concepts of logistics performance measurement. The chapter discusses the challenges involve in apparel companies sourcing strategies, the importance of vendor selection and vendor logistics performance. The research pursues an in-depth study of the dependent variables – the value of VLPM, and provides an overview of the related independent variables. It examines the development trends in
Asia’s apparel sourcing; the roles of logistics management in the apparel industry; logistics operation outsourcing; performance measurement; and vendor performance. The chapter ends with a summary of the contribution and importance of the research.

Chapter 3 justifies the choice of case study methodology for this research. This chapter explains the details regarding the research design, research procedures, instruments used and their limitations. It also discusses the unit of analysis, ethical considerations, and the validity and reliability of the research. The selection and justification of the research paradigm, the methodology and the data analysis in this research will be provided in more detail in Chapter 3.

Chapter 4 provides a profile of the participants in the study. It presents the data collected through the interviews, and demonstrates how they were analysed. The findings from the data analysis are presented as answers to the research questions presented in Chapter 2. Finally this chapter explains how the rigour of research has been maintained.

Chapter 5 concludes the thesis. It draws conclusions about each research question and the research problems identify in Chapter Two. The chapter links the findings from Chapter Four to the research questions. It discusses the research results’ contributions for theory and current practice. The importance of the research is revisited and redefined. The chapter describes the limitations discover during the course of the research. Finally, a discussion of the implications for further research is provided.

1.8 Chapter Summary

This research studies and proposes the development of an effective measurement tool, namely the ‘Vendor Logistics Performance Measurement’ (VLPM) tool for logistics management in Asia’s apparel industry. This chapter provides a brief description of the research background, the research objective and problems, gaps in current knowledge, the research contributions, the methodology and the assumptions. The outline of the field of
study is provided in this chapter, which sets the scene and lays the foundations for the research.
Chapter 2 – Literature Review

2.1 Introduction

This chapter provides a theoretical foundation for the research, developed by reviewing the existing literature. Given that the topic for this research is the VLPM that applies to the apparel industry in Asia, the review identifies pertinent research questions by exploring the development of apparel industry, the global apparel sourcing development; the logistics management and logistics performance measurement. A structural map of this chapter is given in Figure 2-1.

2.2 Global Apparel Sourcing Development

Globalisation is the direction of today’s business environment worldwide. The globalisation concept and business approach have rapidly attracted the interest of authors to discuss issues such as global marketing, organisation design, conspiracy and ethics and corruption (Roukis, 2006; Svensson, 2002a; Zekos, 2004). Spich (1995, p.7) states that:

Globalisation is a conceptualisation of the international political economy which suggests and believes essentially that all economic activities, whether local, regional or national, must be conducted within a perspective and attitude that is constantly global and worldwide in its scope.

Global sourcing has become an increasingly important part for organisations’ competitive strategies (Buxey, 2005; Ettlie & Sethuraman, 2002; Kumar & Arbi, 2008). Companies are beginning to capture the benefits of globalisation within a firm’s supply chain through the integration of global operations such as engineering, logistics, procurement, and even marketing. Worldwide sourcing efforts increase organisations’ understanding of customer pressures. Companies are faced with the need to manage prices and costs.
This need is greater than any other performance requirement identified (Buxey, 2000; Trent & Monczka, 2003). During the past decades, international transportation costs have dropped considerably, and borders have become more porous. These conditions have created a strong economic incentive for organisations to develop sourcing of materials
globally. However, the rising pressure to reduce the transportation carbon footprint has made global sourcing considerably more complex (Holweg et al., 2011). An effective global sourcing strategy can be considered as a strategic asset that is an internal strength the firm develops over time. This internal strength is viewed as an important source and determinant of a firm’s competitive advantage.

According to Humphreys et al. (1998), global sourcing as a business strategy steadily increase in importance throughout the 1980s to the early 1990s. International sourcing involves buying from suppliers outside the firm’s country of manufacture. It requires purchasing personnel to view the world as a potential source for raw materials, components, services and finished goods. Organisations that source outside their own country expect to achieve dramatic and immediate improvements through cost reductions, quality improvements, increased exposure to technology, and delivery and reliability improvements (Rajagopal & Bernard, 1994). Furthermore, the development of a global outlook helps organisations to: introduce competition to the domestic supply, establish a presence in foreign markets, increase available sources, satisfy offset requirements, and react to the offshore sourcing practices of competitors (Stephens et al., 1996).

Apparel manufacturing is a global industry active in both developed and developing countries. But the productivity performance of this industry is significantly different in different countries. Productivity is a critical factor of buyer’s sourcing considerations. In India for example, the apparel industry is likely to face stiff competition in the quota-free world in both the domestic and export markets. The major stumbling block for the Indian apparel industry in becoming globally competitive seems to be the low productivity of its manufacturers (Bheda et al., 2003). Besides cost and productivity, there are other challenges for organisations to consider in sourcing from offshore. These challenges can include language barriers; different customs; different business practices; foreign exchange fluctuations; transportation delays; and inventory management (Cho & Kang, 2001).
The textile and apparel sector has been at the forefront of globalisation for many years. Approximately 200 nations are involved with apparel production for international markets. In United States, more and more textile and apparel companies engage in international business in both sourcing production and marketing products. These companies include Wal-Mart, Lands’ End, Inc., Gap, Liz Claiborne and Ann Taylor. They source internationally without having any production facilities in USA but with markets throughout the world (Iwanow et al., 2005; Yu & Jin, 2005).

Ha-Brookshire and Dyer (2009) report that 90 per cent of apparel products distributed by leading apparel firms in the United States are foreign-made. They reduce the volume of domestic production of apparel products. In the past, United States apparel manufactures dominate the apparel industry supply chain in export-oriented roles, from cutting to sewing operations to machine handling, to production flow efficiency management. This has changed and many United States apparel firms now focus on importing, designing, buying, sourcing, and distribution with a special emphasis on timely market research, production development, and variety in merchandise.

The United States is the world’s largest single economy and a key market for many exports. The US has increased textile and apparel imports with the progressive liberalisation of international trade over the last 50 years. In the early 1990s, import growth in USA accelerated with the initiation of the North American Free Trade Agreement (NAFTA) which aims to eliminate tariff and non-tariff barriers between the USA, Canada and Mexico. Teng and Jaramillo (2005, p.503) mention that ‘the trend began with the boom of the so-called Maquiladoras in Mexico and Central America. After NAFTA is created, the popularity of the Maquiladoras reaches unprecedented levels’. NAFTA is enhanced with preferential access to the US market for apparel assembled in selected Caribbean countries from US fabrics by the Caribbean Basin Initiative (CBI) in the 1980s (Oh & Suh, 2003). In 2001, China entered into the World Trade Organisation (WTO). Thereafter, the import quota system was abolished under the Multi-Fiber Arrangement (MFA) in the beginning of 2005, and by the ratification of the
Dominican Republic - Central America Free Trade Agreement (DR-CAFTA) in late 2005, the United States import growth was boosted (Chi & Kilduff, 2010).

In Europe, Italian manufacturing firms are among the major competitors in textiles and clothing. Guercini (2004) reports that Italy represents over 27 per cent of turnover and 24 per cent of the investments made in the 15 countries of the European Union in the field of textiles. The position appears to have remained basically stable between 1996 and 2002. In 2002, the Italian position appears to have been even stronger, representing over 37 per cent of turnover and no less than 48 per cent of investments. However, to reduce cost, a process of offshore investment and production decentralisation was initiated by some of the Italian textile and apparel firms as well as other European firms as early as the late 1980s (Åkesson et al., 2007). The Italian international trade tends to produce semi-finished textile products at the countries that are fairly close to Italy geographically, such as Romania. The trend also extends to distant countries including China. Outsourcing to other low-cost countries such as China is common among European and North American companies (Fredriksson & Jonsson, 2009). It makes the position of China notably different. China ranks first among countries from which textile products and clothing are imported into Italy.

In Asia, not all the countries are growing as quickly in apparel and textile exports as China. Thailand’s apparel industry has shown growth and success over the past five decades owing to increased global trade (Watchravesringkan et al., 2010). In 2007, the apparel and textiles industries was 4.5 per cent of the total GDP and employed approximately 20 per cent of the total industrial workforce. In the early 2000s, Thailand was a major exporter of textile and apparel products and ranked among the top 15 world exporters in both categories. However, the fast development of the ASEAN market, globalization, and textile and apparel trade liberalisation create many challenges to the Thailand textile and apparel industry, particularly regarding fierce competition from China and other Asia countries such as India and Vietnam (Jin, 2004b).
South Korea has faced the same challenges as Thailand. The textiles and apparel-related industry in South Korea was a major economic success during the 1970s. It accounted for 41 per cent of South Korea’s total exports, and nearly 30 per cent during 1980s. By that time, South Korea was the fifth-largest exporter of textile and apparel-related goods in the world. However, owing to increases in labour costs, the industry’s international competitiveness has been decreasing. During 2002, the industry only accounted for 10.1 per cent of South Korea’s exports (Jin & Moon, 2006).

There is evidence indicating that a corporation is very much defined by its purchases and that corporations benefit from close partnerships with their suppliers. Consequently, sourcing decisions become increasingly important in a firm’s growth and profits (Zeng, 2000). In the apparel industry, garment production involves a high amount of labour (30 per cent to 50 per cent of the final garment cost) and this leads apparel producers to search for lower wage locations to reduce production costs. Therefore, the lower labour-cost advantages of less-developed countries has led apparel producers to prefer them over industrialised countries (Lin et al., 2002; Ettlie & Sethuraman, 2002; Fredriksson & Jonsson, 2009). In their study of consumers’ ethical impacts upon apparel purchases, Iwanow et al. (2005) find that consumers do not really look at the label when shopping for fashion items. Where the item of clothing is manufactured does not appear to significantly affect consumer purchase decisions. The main influences relating to the purchase of apparel are price, product quality and style.

Any successful global sourcing strategy is complex, requiring commitment from top management and the allocation of resources to coordinate and integrate worldwide sourcing activities. This integration is critical to achieve and support the corporate global strategic thrust. With new markets and new competitors challenging established businesses, global sourcing is now offering an opportunity for organisations to meet these challenges on a global basis (Rajagopal & Bernard, 1994). According to Williamson’s (2005) article about the changes to the industry in Asia, organisations will continue to seek global market development and sourcing opportunities, and there should be no doubt that it will take a different kind of company to succeed in Asia.
2.2.1 Apparel Sourcing Development in Asia

Population increase in the near future in Asian developing countries will be much greater than that of any other region on account of its current population base (Jegasothy, 1999). Population growth is recognised as a valuable intrinsic process during the initial stages of development because it generates human resources. According to a United Nations Urban Agglomerations study in 1996 (Dixon & Karboulonis, 1999), it was predicted that ten out of the twelve largest cities in the world would be in emerging markets by 2015. These authors predicted that eight of these cities would be in Asia. The technological development and population increase in developing countries are sometimes seen as positive factors that stimulate economic growth. Human resource increase is a positive factor that stimulates economic growth. Asia is changing into more cohesive urban groupings in which some of the largest cities in the world are located.

The United Nations Development Program (UNDP) has stated that: “Information and communication technology (ICT) has become an indispensable tool in the fight against world poverty” (Wood, 2004, p. 301). An improvement in the quality of life has led to a greater technical progress that has led in turn to higher incomes. This has created a new generation of consumers. This has been attributed to improvements to education. One of the most significant trends in the Asia-Pacific region is the rapid spread of the internet and the growth of e-commerce. This has helped to develop a more productive population with a greater capacity for absorbing new technologies. Huggins and Izushi (2008) introduce the World Knowledge Competitiveness Index (WKCI) in a study which concludes that taking into account the fact that Asian regions often excel in human and knowledge capital inputs, many Asian regions, particularly in developing economies such as India and China, will continue to improve their knowledge competitiveness coupled with the lag effect of inputs and outputs.

In 1997, the Global Competitiveness Report (1997) ranked Hong Kong as the second-most competitive economy in the world, after Singapore (Humphreys et al., 1998). Singapore and Hong Kong are the gateways with outstanding transportation facilities. A
buyer can purchase the merchandises from most parts of the region and ship them to any
destination in the world through the two gateways. With continuing urbanisation and
industrialisation, new technologies for the production, distribution and exchange of goods
and services are widely available and substantially in place. The Asia-Pacific includes
Singapore, Japan and Hong Kong as places for international business. They have grown
in stature as the economies of this region have expanded (Savery et al., 1998). The ‘Asian
tigers’ all have strong trade surpluses, and their trade with the United Stated is of vital
importance. Moves by the United States to reduce preferential tariffs accord to newly
industrialising countries which are now strong economies, such as Hong Kong, Korea,
Taiwan and Singapore, have been forcing changes in growth and trading patterns
throughout ASEAN and within the Asia-Pacific region.

Despite political problems and racial misunderstandings, both internal and external to the
region, Asia-Pacific trade and trans-Pacific trade are developing strongly, and new
relationships are being formed quickly. Savery et al. (1998) argue that the importance of
the Asia-Pacific as a place for international business is highlighted by the findings of the
1994 World Competitiveness Report. Singapore, Japan and Hong Kong are in the top
position among a total field of 41 countries. There are 11 Asia-Pacific countries rank
equivalently on an average competitiveness to the NAFTA group of Canada, Mexico and
the United States and marginally higher than some of the core states of the European
Union.

According to the study of Tsang and Au (2008), the three NAFTA partners have gained
significant advantages of trade liberalisation owing to free trade in the textile and
clothing (T&C) industries. After NAFTA was implemented in 1994, the South and South
East (S&SE) Asian developing countries’ T&C exports to the United States were
seriously affected by the trade diversion effect (Oh & Suh, 2003). Finally, with the
gradual elimination of quotas under the Agreement of Textiles and Clothing (ATC), the
effect has come to an end. The NAFTA T&C model was dropped and was no longer
sustainable in the time interval from 2002–2005 (Kilduff, 2005; Shelton & Wachter,
2005).
Asian regions possess potential capabilities including supplies of human resources, rapid information and communication development, knowledge and talent building, and fast economic growth. It is not difficult to imagine Asia as an important battlefield for global business practitioners. With all the potential advantages Asia provides, the majority of apparel sourcing will continue to be in Asia, particularly China. Since the export quotas on T&C products have been phased out from 2002 onwards, NAFTA no longer gives any benefit to its members in T&C exports after the final phase of the ATC. Mexico and Canada have lost United States market share in textiles to South and South East Asian (S&SE) countries. The comparatively low costs, and improvements in a quality-driven manufacturing base have significantly increased China’s market share in the new quota-free environment in the global T&C trade (Oh & Kim, 2007; Shelton & Wachter, 2005). At the same time, S&SE Asia developing countries are becoming more important in the global T&C trade. In recent years, S&SE countries T&C exports to the United States have been increasing. In 2005, India, Pakistan, Indonesia and another seven countries were among the top ten clothing importers to the United States (Tsang & Au, 2008, p. 567).

China’s apparel industry has established the world most responsive and efficient supply-chain network, and China has been the number one supplier to the United States apparel market since 2003. Figure 2-2 shows the growth in United States clothing imports from China. China’s share of the United States market rose from 10 per cent during the 1990s to 20 per cent in 2005 (Tsang & Au, 2008, p. 569).

From January 2005, when the United States removed quotas on Chinese imports, retailers and apparel companies have been increasing their sourcing from and developing their long-term partnerships with China. Since China joined the WTO, market access restrictions and the regulations of foreign investment in the apparel retailing sector have been gradually removed, and it is expected that the competition in the apparel market will become even more intense because of the increasing number of foreign firms entering China (Kwan et al., 2003; Oh & Kim, 2007).
Low-cost production is no doubt the primary driver for the development of global sourcing strategies. However, other criteria include: proximity (which can refer to both geographic and cultural distance); political considerations; human resources; infrastructure; and quality and reliability. These are some of the key criteria buying firms need to address before making offshore sourcing decisions (Fredriksson & Jonsson, 2009; Oke et al., 2009). If the right sourcing strategy is not chosen for an appropriate supplier to perform, the negative impacts on the organisation can be drastic. When selecting sourcing suppliers, there are various strategic criteria that buying firms need to consider. Therefore, it is crucial for the decision-makers to thoroughly analyse the impacts of various outsourcing policies on their organisations (Ordoobadi, 2010). The selection of offshore suppliers or vendors is important for the success of a buying organisation.

2.2.2 Vendor Selection

Global sourcing and vendor selection are not just done once. They are business strategies that connect to the business development directions of organisations. They support the continuous improvement of organisations’ competitiveness. Markets are changing beyond recognition; processes are undergoing rapid technical change while costs and
prices vary widely. Organisations are advised to create long-term vendor development strategies that consider the building of interrelationships with selected vendors and which take account of various critical elements including structure, strategy, technology, relationships and tasks (Chakraborty & Philip, 1996). The creation of a vendor development strategy can provide organisations with the flexibility to respond to competitive challenges (Krause & Ellram, 1997; Seetharaman et al., 2004).

The selection of an effective vendor is important to an organisation in creating a competitive edge and gives positive impact on its performance (Hsu et al., 2006). Vendor selection and evaluation is critical as any failure can be enough to upset the company’s financial and operational position (Mandal & Deshmukh, 1994). In selecting a vendor, a company has to consider many factors and needs to develop a long-term vendor relationship because vendors are considered as the best intangible assets of any organisation.

In 1966, 23 criteria for assessing the performance of suppliers were identified, based on 170 managers and purchasing agents’ responses in one of the original studies in the supplier selection (Ordoobadi, 2009a). This study has been widely used as a foundation in the majority of supplier area. However, vendor selection and evaluation can use various approaches. Weber (1996) suggests the data envelopment analysis (DEA) can be used a tool for measuring vendors’ performances. O’Brien (2012, p.214) suggests that:

> Selecting a supplier is like putting all the candidates into funnel and running a series of selection and evaluation activities that progressively eliminate those who do not meet your requirements whilst positively identifying the suppliers that offer the best solution from those that remain.

Other authors have proposed the use of a prototype web-based system for assessing suppliers involved in product development (Humphreys et al., 2005); and constructing dynamic criteria collection for vendor selection in the supply chain (Li, 2009).
Analytical hierarchy process (AHP) (Vaidya & Hudnurkar, 2013) and analytical network process (ANP) (Teng & Jaramillo, 2005) are two other methods for supplier selection discussed in the existing literature. In the decision-making process, AHP incorporates both qualitative and quantitative factors. Ordoobadi and Wang (2011, p.632) have stated that ‘ANP provides a systematic way for weighting attributes by a series of pair wise comparisons of all attributes’. These studies and methods aim to help organisations to evaluate and select the appropriate vendors according to their unique global sourcing strategy needs.

When selecting a service or product supplier, customers evaluate the total cost, the delivery timeliness and service quality that the supplier provides (Chen, 2008; Bartlett et al., 2007). Ranking of vendor selection criteria by Mandal and Deshmukh (1994) indicates the key criteria in vendor selection facing the management of organisations. The major consideration includes the financial position of the vendor, transport, communication, the production facilities, capacity and technical capability. Consequently, delivery, price and after-sales service are the three top criteria whereas quality, attitude and willingness to do business are the second-level criteria. In developing the supplier evaluation model, delivery is identified as one of the top critical areas of decision-making in global sourcing (Teng & Jaramillo, 2005; Ordoobadi, 2009a; Ordoobadi, 2009b; Ordoobadi & Wang, 2011). Speed in product delivery is one of the main forces of manufacturing restructuring (Vastag et al., 1994). Oxborrow and Brindley (2014, p. 265) state that:

...whilst the role of selecting suppliers, coordinating ranges, distribution and contractual terms falls within the remit of the powerful retailer – possibly to the detriment of the supplier and in some cases working against fast fashion supply.

Delivery and physical distribution of goods are synonymous in the business environment. Vendor performance in logistics management has a crucial effect on delivery performance and this is a critical consideration in companies’ selection of vendors.
2.3 Logistics Management

Since supply chain management (SCM) and logistics management (LM) recognise as important for enhancing a company’s competitive advantage (Ballou, 2007), scholars and practitioners have been discussing ‘value added’ services development in SCM and LM activities (Collins et al., 2002; Hines et al., 1998; Katz et al., 2003). According to Christopher (1998, p.18), supply chain management can be defined as:

The management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole.

The earliest mention of logistics known in the literature was in 1901, concerning agribusiness (Sankaran & Luxton, 2003). Other early references to logistics are found primarily in military applications (Lummus et al., 2001). Logistics management aims to ensure the efficient and effective distribution and storage of supplies and personnel. It was recognised and made fashionable as a result of the Gulf War (Scribbins, 1994). Since then, much attention has been paid to logistics management, and a vast number of articles, journals and books related to its concepts, execution and development have been published. Logistics Management (LM) has several names. Naim and Towill (1994) called LM Materials Management; Wilkinson (1996) used the term Channel Management; and Dadzie (1998) called it Distribution Management. Nevertheless, Logistics Management is the most commonly accepted term among logistics practitioners (Lummus et al., 2001).

In recent decades, the management of physical distribution, business logistics and supply chain management has changed; rather than being managed individually, the activities involved in a product supply chain have been managed in an integrated fashion across multiple echelons. Logistics have become part of Supply Chain Management (SCM). According to Christopher (1998, p.4):

Logistics is the process of strategically managing the procurement, movement and storage of materials, parts and finished inventory, and the related information flows.
through the organisation and its marketing channels in such a way that current and future profitability are maximised through the cost-effective fulfilment of orders.

Pollitt (1998) points out that LM has been an important part of any company’s business strategy in the last quarter of twentieth century. LM has developed rapidly in recent decades as one of the essential business management strategies for firms. Volvo (Engstrom et al., 1998), Black & Decker (Chan, 2005) and Nike (Sridharan et al., 2005) are well-known firms that have put logistics strategies and systems into action and have built reputable protocol models. A company developing an effective LM strategy needs to understand the internal and external logistics operations or activities based on the nature of their business.

2.3.1 Typical Logistics Activities

Transportation

Transportation has been recognised for many years as one of the most important activities in physical distribution (Jayaraman, 1998). A transportation system that provides a reliable service reduces supply chain uncertainty, and the amount of inventory required throughout the chain (Tracey, 2004). Stank & Goldsby (2000) point out that transportation services play a central role in seamless supply chain operations. It moves raw materials from supplier sites to manufacturing sites, and repositions finished goods among different plants and distribution centres.

Transportation creates value for place utility. It is also a factor in the creation of time utility because it reflects the timeliness and consistency of products moving from one location to another. (Mentzer et al., 1997; Olavarrieta & Ellinger, 1997; Stock, 1997). The transportation cycle time has a direct impact on the manufacturing process, and therefore on customer’s perception of channel performance (Ng et al., 1997). In addition, the fast and efficient delivery of products can also help to increase customer satisfaction. According to Marchet et al. (2009), freight transportation represents a key issue in the
economic and social development of a country. The management of the freight transportation process is complex since it involves a plurality of players, each with specific features and requirements. The overall framework includes structured third party logistics service providers, small transportation companies, couriers and express couriers, rail and sea carriers, dispatchers, multi-modal transport operators as well as port and inter-model terminal infrastructures.

Coyle et al. (2000, p.20) further defines transportation as ‘the creation of place and time utility in early stage and further defined as the users can buy a ‘bundle of services’ from carriers with variety mode of services with different prices frequently in effect from the different services from a total logistics management perspective’. Transportation plays a key role in logistics, not only in products movement. It also moves passengers and freight around the world. It helps to create a social structure so that people travelling or living within a transportation network share ideas and experiences. In logistics management of physical goods movement, transportation is vital because it involves important tradeoffs with inventory costs (Tyworth & Ruiz-Torres, 2000; Huq et al., 2010; Tracey, 2004).

The selection of an effective mode of transport depends on product development, and has to take into consideration upfront the ease or difficulty of transport. Jayaraman (1998) suggests the basic design problem in any production and distribution network is to match supply and demand at the output points of the system in the most economical way. The physical characteristics of product, the costs of transportation, transport equipment availability, and capacity of equipment to transport the product are all important for the decisions about product development. Since transportation cost is a variable expense of businesses, it has an obvious impact on price, target market, purchasing and facility location (Svensson, 2002b). According to Stock and Lambert (2001), there are five major types of transportation services: road, rail, air, water and pipeline.

**Road transport** is the main mode of goods transportation in industrialised countries. There are two different trucking modes that logistics managers can choose. They are full truck loads (FTLs) and less than trucks loads (LTLs). FTL is used if the goods to be
delivered are near to the truck capacity. The shipping cost depends on the final destination and the number of intermediate stops. Because the truck capacity is saturated, the cost per transport ton is lowest (Pollitt, 1998). LTL is another choice in which only a fraction of the entire truck capacity is hired and the cost is proportional to the transported amount with specific fees depending on the weight ranges (WRs) and the destination zone. The cost depends on the customer locations and quantity of goods to be shipped (Caputo et al., 2006).

Rail transport is available in almost every major metropolitan city as well as some smaller communities. From 1850 to 1950, it has been an important transportation mode for both passengers and freight in the United States (Coyle et al., 2000). Trains are still a vital part of the transportation systems and play an economic role. Railway operations in many countries are traditionally operated by the government, especially in Asia (Goh & Ang, 2000). Privatisation of railway operations has been a recent popular trend and British Rail and the London Underground are successful pioneers (Chan et al., 1998).

Rail transportation provides higher volume and less cost by weight than air and motor transport. However, in comparison with the motor carriers in highway networks, rail transport lacks the versatility and flexibility owing to the limitations of fixed track facilities. According to Hilmola (2007), for most shippers rail transport provides terminal services like air and water transport rather than point-to-point services. Furthermore, trains travel on timetables and departures are less frequently than those of motor carriers.

The market demands transportation flexibility and agility and so railway freight transportation has lost its competitive advantage and faces significant demand decline compared to other transport modes. Railways transportation lacks the capability for point-to-point delivery but can be developed as part of express transport chains that connect with other transport modes such as road and air to support high volume but lower per weight costs for long distance domestic transportation (Ohnell & Woxenius, 2003). Besides railways, water transport is another low cost transportation mode.
**Water transport** can be on inland waterways such as rivers, canals and lakes or it can be on the oceans. In general, inland waterway carriage is suitable for moving bulky, heavy, low unit-value commodities for which speed of delivery is not of primary concern. Internationally, water transportation is used for inbound and outbound goods and the range of products transported is much broader. With the growth of world trade, the demand for water transportation across oceans has surged. In 1990, a report showed over 95 per cent of international freight is moved by ocean carriers (Kent & Parket, 1999). Ocean shipping is considered to be the primary transportation mode for global trade because of its low freight rates, despite the long transit times involved (Bhatnagar & Teo, 2009). Ocean carriers in general operate container shipping that can be used in two different ways, namely full container load (FCL) and less than container load (LCL). LCL means grouping and loading shipments with smaller volumes into a container. Therefore, a consolidation hub is set up to perform small shipments to consolidate and optimise ocean container shipping (Creazza et al., 2010).

**Air transport** compares to ocean transportation, providing smaller volumes, faster delivery but higher costs. Due to global business environment changes with the demand for less delivery time, the need for faster transportation modes is increasing. This has led to a surge in the demand for air transport. However, because of its high cost, air transport is typical used only for critical shipments (Tibben-Lembke & Rogers, 2006). Air transport can be domestic or international. Domestic air freight competes directly with trucking services. International air freight competes with water transport. For most commercial airlines, transportation of freight is incidental to passenger traffic. However, there are all-cargo carrier transport companies. Air carriers usually transport high-value or transit time-sensitive commodities. Transport by air of low-value items usually cannot justified (Coyle et al., 2000). Undoubtedly, the demand for higher customers service levels in the future, and the growth of international shipments will mean air freight will continue to play an important role in the logistics plans of many companies. The volume of air freight has increased and shows continuing growth even though costs are higher than for other transportation modes (Lobo & Zairi, 1999).
**Pipelines** are one of the five major transportation modes. They transport only a limited number of products in the form of liquid, gas or slurry. Pipelines are used for natural gas, petroleum products, crude oil, water, and coal slurry. Pipelines provide extremely high levels of dependability at a relatively low cost. They can deliver products on time because the flows of products within the pipeline are monitored and controlled by computer. Losses and damage due to pipeline leaks or breaks are extremely rare. However, if any failure occurs, it can have severe impacts on the environment (Dey et al., 2004). Pipelines are not a common transportation mode in the general commercial business environment because of the limited range of cargo they can carry, but in the oil industry, petroleum pipelines are the nervous system (Dey, 2001).

The fast growth of global trade and market competition have changed the basic role of transportation from operationally meeting low cost or high service criteria to providing a strategic edge by simultaneously meeting elevated service requirements at increasingly lower costs (Stank & Goldsby, 2000). It is not uncommon for companies to select mixed modes of transportation. Thus, the decisions regarding a transportation framework require a strategic, long-term decisions focus on the overall supply chain transportation system. Because companies are confronted with competitive pressures, and because of the need to cut costs, the pressure to downsize and the need to improve customer service, they have to consider whether to ‘make or buy’ some of their non-core activities, including transportation. Thus, the outsourcing of transportation or of the entire logistics operation to Third Parties Logistics (3PL) becomes an important business strategy. Warehousing could be one of the outsourced logistics operations.

**Warehousing**

Warehousing is an integral part of every logistics system. It is a primary link between producers and customers. Warehousing involves storing and retrieving product somewhere between manufacturing and consumption location. It also provides the inventory item’s status, condition and disposition to management (Gunasekaran et al., 1999a). The important considerations of warehousing in logistics systems are economies of scale, costs and customer service. There are several major functions of warehousing
such as: receiving, transferring, order selection, shipping, storage (which can be temporary or semi-permanent), and information transfer that links all activities taking place in the warehouse (Faber et al., 2002).

Fast development of technology has brought warehousing operations and management into a new era. The difficulties of warehouse management are exacerbated when dealing with a large number of buildings in a relatively large geographical area. Johnston et al. (1999) propose the use of a geographical information system (GIS) with a database management system (DBMS) to achieve near optimal storage locations for stock items. Radio Frequency Identification (RFID) is one technology with potential for both retailers and suppliers (Vijayaraman & Osyk, 2006). Rizzi and Zamboni (1999) argue that the Warehouse Management System (WMS) plays a crucial role in the planning and control structure for achieving the desired high warehouse performance. They suggest that a combination of the Enterprise Resource System (ERP) with WMS can achieve an effective synergistic effect and thus effectively increase system efficiency. Fundamentally, the major part of warehouse management is dealing with the facilities. The size and location, layout, design and equipment set up of facilities are all imperative considerations with significant impacts on a company’s ability to satisfy customers and make profit (Hassan, 2002). The development of a company’s warehouse operations ties intimately with the packaging of goods.

**Packaging**

In warehouse and materials management, packaging is important because it affects warehouse efficiency and effectiveness. Good packaging of goods can have a positive impact on layout and design and overall warehouse productivity. It helps to optimise services, costs and convenience. Packaging is important because it serves two basic functions: marketing and logistics (Silayoi & Speece, 2007). In marketing, the package of products acts as a brand communication vehicle that provides customers with important information about products, and promotes products through the use of colour, sizing and so on (Underwood et al., 2001). Prendergast (1995) explains that packaging is one of the most important areas of logistics since it facilitates logistics objectives by allowing the
product to be: contained, protected, apportioned, unitised and communicated. The packing of a product should be designed to provide the most efficient storage. Good packaging should interface well with the company’s material handling equipment and should allow efficient utilisation of both storage space and transportation cube and weight constraints (Varila et al., 2007). With the clear and loud call out for environmental protection in the business environment, a good packaging strategy can help management address environmental concerns, specifically in the reuse and recycling of packaging materials (Prendergast & Pitt, 1996). Besides packaging, inventory management is another logistics activity that affects an organisation’s warehouse operations and impacts on environmental concerns.

**Inventory Management**

Good inventory management can minimise the wastage of many resources including materials, storage space, management and costs. Williams and Tokar (2008) believe that effective inventory management helps to improve a company’s cash flow and returns on investment. Stock and Lambert (2001, p.228) contend that the holding of inventory serves five major purposes within the company; it enables the company to achieve economic of scale; it balances supply and demand; it supports specialisation in manufacturing; it protects the demand and order cycle from uncertainties; it acts as cushion in supply chain between critic interfaces. Corporate profitability can be improved by increasing sales volume or cutting inventory costs (Wallin et al., 2006). A company keeping high levels of inventory may have better in-stock availability and more consistent service levels but the costs associated with high levels of inventory usually exceed the benefits derived. However, low inventory levels can reduce fill rates on customer orders and result in loss of sales (Koumanakos, 2008).

Inventory has a major impact on most performance measurements for retailers as it is the most significant financial asset (Lee & Kleiner, 2001). Economic order quantity (EOQ) is the best model under conditions of certainty to minimise and balance the total inventory carrying costs and ordering costs (Ballou, 2000). For situations of uncertainty, the Fixed Order Point, Fixed Order Quantity Model and Fixed Order Interval Model are effective
for inventory management because they enable the company to keep a safe stock level determined by the demand during the ordering cycle (Nagarur et al., 1994). Aghazadeh (2003) recommends the implementation of Just-In-Time (JIT), a management theory and a broad concept of business that can eliminate waste and unnecessary inventory. An effective inventory management can affect a company’s profitability. It controls investment in inventory by keeping back orders constant; minimising the numbers of cancelled orders; avoiding periodic shortages of storage space and inventory items; and controlling variance in inventory (Rajeev, 2008).

**Order Processing**

Croxton (2003) describes order processing as the nerve centre of logistics systems. Each customer order serves as a message that sets the logistics process in motion. An effective order process and fulfillment of orders have a direct impact on the cost and efficiency of entire operations. An effective order process can improve customer communications and total order cycle time. Furthermore, it leads to substantial inventory reductions and transportation efficiencies. A customer order cycle starts from the placement of an order and ends when the product is received by the customer (Tracey et al., 2005). The order cycle consists of: order preparation and transmission; order receipt and entry; order processing; warehouse pick and pack; transportation and customer delivery (Willis, 1998). In manufacturing, order release has concentrated on the application of the order process to control the flow of material into the manufacturing system. The same logic is applicable to a supply chain environment. For SCM, the order release mechanism acts as a filter and a capacity management tool. The order release mechanism releases orders to the supply chain only when a specific order needs to be released and at the same time has a good chance of being on time and within costs (Chan et al., 2001).

Pibernik (2006) explains that, in recent years, companies have been striving for increased supply chain efficiency through higher resource utilisation and inventory reductions. An efficient supply chain with limited slack and buffer in terms of capacity and inventory becomes more vulnerable in regard to demand fluctuation, supply shortages and uncertain
manufacturing yields. Therefore, order fulfillment systems are increasingly being employed and play an important role in managing stock shortages situations. Order processing has a direct impact on the customer service levels achieved by the company and the total supply chain.

All logistics function components, including order entry and processing, have benefited from the application of electronic and computer technology. With integration into the information system, order processing plays a key role in achieving customer service goals at competitive cost. The fast development of e-technologies enable companies’ supply chain integration; compression of order cycles, and improvement in on-line customer experience and sales channel fulfillment. E-technologies enable linking up supply chain communities on an open, flexible and integrated platform, which enhances collaboration between partners, suppliers, manufactures, distributors, customers and logistics service providers (Lang, 2001). Logistics management aims to integrate materials activities to maximise the time and place utilities of goods to the customers (Fung & Wong, 1998; Horscroft & Braithwaite, 1990). Logistics activities are connected, and each one plays a key role that contributes through the logistics operations process. Nowadays, the word ‘value added’ seems to be a buzz word in all business environments. Companies need to maximise the logistics value chain to support business strategy development.

### 2.3.2 Logistics Value Chain

Uncertainty regarding the quantity of a product to be produced, sold, and shipped makes it difficult for a company to plan for logistics capacity and identify what kind of services are required (Tibben-Lembke & Rogers, 2006). Every company has an operational supply chain that is unique to the company. It aims to strategically create a primary supply chain to position the particular product and service. A supply chain is recognised as a business strategy that provides significant business insight instead of merely an operational tool or technique (Cox, 1999). Satisfying customers is the best method for organisations to gain a competitive advantage (Kim & Kim, 2001). Rainbird (2004) identifies the development of the value chain in operations management and its
importance in forming a structured response to market-led opportunities. The constant refinement of business models is as important to the success of the firm as the firm’s supply chain strategy, and both are critical to the integrity of the firm’s overall value chain.

Traditionally, retailers placed infrequent bulk orders to manufacturers for goods in the least costly plant, as long as its quality is adequate for the market. As a result, the retailers have to bear the risk of holding inventory. In order to minimise the risk of holding inventory, Wal-Mart (Jin, 2004a) introduces ‘lean retailing’ which involves frequent orders, small replenishment shipments based on real-time sales information provided by the information technologies of bar coding and electronic data interchange (EDI). The concept drives the improvement of agility for goods manufacturing. It enhances the retailer’s ability to respond quickly to changing customers’ needs, which become a critical factor in sustaining a competitive advantage. The lean retailing concept has been rapidly adopted by mass merchandisers and retailers. United States retailers’ demands for speed, flexibility and low cost have driven the global apparel and textile industry to capitalise on the most responsive and efficient supply chains. Logistics operations have progressed from the management of time and place utilities of goods to become part of a company’s customer services strategy in supply chain management (Bolumole et al., 2003; Heskett, 1994, Tucker, 1994).

According to Baines (1996), customer service is more than just customer care. If a company understands its customers, it can properly identify their needs and set about meeting them reliably over time. The key challenges of SCM are to manage effectively the scope of the supply channel, and envision the best estimate of the revenue contributions from the customer service levels (Ballou, 2007). Supply chain and logistics management are functions that are supporting activities in the overall value chain (Walters & Lancaster, 2000). Holmstrom et al. (1999) suggests a supplier company can proactively start building its future business models by identifying and piloting new value offerings to different points in the customer demand chain.
Effective value chain management requires organisations to identify the core in their business. Bhatnagar and Teo (2009, p.203) argue that:

…value chain analysis comprises disaggregation of the firm into its strategically relevant activities in order to understand the behavior of costs and the existing and potential sources of differentiation.

Companies need to obtain the best-in-class cost advantage, profit models and proprietary technology processes, and the source of differentiation (Gottfredson & Phillips, 2005).

### 2.3.3 Logistics outsourcing

Many companies outsource logistics activities to logistics service providers to avoid substantial investment and to focus on the company’s uniqueness (Wong et al., 2000). Embleton and Wright (1998) argue that outsourcing must be part of an overall corporate strategy. The outsourcing of services and operations to external providers has attracted growing interest from academics and industrialists (Boer et al., 2006; Bolumole, 2001, Rao & Young, 1994). Outsourcing has become so sophisticated to a few leading edge firms that even their core functions like engineering, R&D, manufacturing and marketing can be outsourced (Gottfredson & Phillips, 2005).

Rushton et.al. (2010, p.541) propose that a scoping review of the 5 key ‘W’ questions should take place for logistics outsourcing. They are: ‘Why outsource? Whether outsourcing is the right step? What are the key requirements? Where are the boundaries? Which outsourcing approach to adopt? Millen et al. (1997) suggest a mixed system may prove to be the best. The evaluation of risks and making appropriate decision for logistics outsourcing is very important (Tsai et al., 2008). For decades, Logistics outsourcing has been common business practice. The impetus for outsourcing emerges from the moribund world economy of the 1980s and 1990s (Embleton & Wright, 1998). There are different terms such as ‘logistics outsourcing’, ‘logistics alliance’, ‘third party logistics’ ‘contract logistics’ and ‘contract distribuiton’ that have been used interchangeably to describe
organisations’ contracting out of part or the whole of the logistics operations that were originally operating in-house (Selviaridis & Spring, 2007).

Logistics outsourcing in general means a single vendor providing multiple logistics services on a contractual basis (Razzaque & Sheng, 1998). Wong et al. (2000. p.3) state that:

…a company may pursue logistics outsourcing for one or more reasons: its own lack of logistics expertise; the desire to focus on its own core competency; the difficulty in maintaining communication and information technology that is up to date; the desire to improve system capabilities along the global supply chain, and build flexibility within available resources.

In general, the top five reasons for outsourcing are: cost reduction, service improvement, operational flexibility, business focus and asset utilisation and efficiency improvement (Cruijssen et al., 2007; Wilding & Juriado, 2004; Londe & Maltz, 1992). Because companies can have different reasons for outsourcing, too often they may consider outsourcing all their non-core operations.

Sink et al. (1996) identify six logistics functions associated with contract logistics in United States of America. The six functions are: transportation, warehousing, inventory management, order processing, information system and packaging. Each of these functions covers various activities that operate to fulfill a company’s internal and external customers’ different logistics needs. A survey of 372 logistics managers in different industries finds that a company can improve customer service and reduce costs by outsourcing multiple logistics functions (Rabinovich et al., 1999). These results are consistent with previous research which finds that a company can improve coordination of information and material flows in the achievement of economies of scale and economies of scope. Logistics management is one of the most outsourced functions along the global supply chain for many of today’s global companies (Embleton & Wright, 1998). Figure 2-3 illustrates five major industry sectors and the associated volumes of outsourcing penetration.
Figure 2-3 Outsourcing Usage by Industries

![Graph showing outsourcing usage by industries.](image)

**Key**
- Business Services
- Logistics
- Information Tech.
- Health Care
- Human Resources


Logistics services can be outsourced wholly or partially. Conversely, services offered by a logistics services provider can either be full or partial. The service coverage for many logistics service providers expand to sales forecasting, order management, packaging and customer service. Some providers even provide a component of ‘value-added’ service to the product being delivered to the market (Cho et al., 2008).

Despite the fact that there are many advantages that a company can achieve by outsourcing, there are also a number of disadvantages and obstacles in implementation. Outsourcing may lead to a lack of incentives to implement holistic solutions, and a risk that inventories become nobody’s responsibility. Also, outsourcing may cause an increase in dependence on subcontractors and deficient market information in terms of costs (Svensson, 2001). Companies need to evaluate extensively the values they can obtain from logistics outsourcing to make a finely balanced decision on whether to outsource or operate in-house (Bolumole, 2003).

The globalisation of business, development of countries’ transportation infrastructure, organisational changes in business practices, and rapid changes of technology are exogenous variables which propel logistics development (Neuschel & Russell, 1998).
This broadens the focus of logistics services to include the total management of goods and information rather than just the movement of goods from suppliers to customers. The demand of companies for logistics outsourcing has accelerated the rapid growth and diversification of different types of operations and services offered by logistics service providers. Logistics services include Third Party Logistics (3PL); Fourth Party Logistics (4PL) and Reverse Logistics.

2.3.4 Types of Logistics Service Outsourcing

Third Party Logistics (3PL)

The use of Third-Party Logistics (3PL) service providers is growing very rapidly since it indicates that companies obtain significant value from outsourcing services to 3PL (Aktas & Ulengin, 2005; Lieb, 2008; Power et al., 2007). Third-Party Logistics companies provide integrated, multiples services in the movement of goods from manufacturers to customers. These services include transportation, warehousing, cross-docking, inventory management, freight forwarding and even packaging. Some companies may deal with just one 3PL firm for a bundle of services. This helps to minimise the company’s day-to-day operating resources by having the third party handling all of the logistics operations.

It has been many years since activities such as freight payment and dedicated contract carriage began to be administered by third parties (Sahay & Mohan, 2006). The outsourcing of transportation and logistics activities has increased. In some instances, entire logistics operations are being outsourced to third parties. All of the transportation modes describe above can be viable shipping options for a firm. The logistics executive has to determine the optimal combination of transport alternatives that are most effective for his or her company when considering outsourcing logistics to 3PL (McGinnis et al., 1995; Qureshi et al., 2008). Third Party Logistics is able to provide bundles of services that are mostly in operational and functional.

Fourth Party Logistics® (4PL®)
With the increased emphasis on supply chain management, companies can extend the outsourcing of operations from 3PL to business processes management by Fourth Party Logistics (4PL). With the increasing recognition of logistics as a competitive parameter, many companies no longer make a decision to outsource logistics operations without considering strategic flexibilities, service response and customisation (Skjoett-Karsen, 2000). Thus, many companies are developing partnerships with Fourth Party Logistics® (4PL®) providers. The concept of a 4PL® was first introduced by Accenture circa 1996. Fourth Party Logistics® and 4PL® are global trademarks of Accenture (Bedeman & Mark, 2003).

Mukhopadhyay and Setaputra (2006) describe 4PL® firms as business process outsourcing (BPO) providers. They are neutral and manage the logistics process, regardless of what carriers, forwarders or warehouses are used. Customers consider 4PL® as strategic partners rather than tactical partners. They focus only on providing operational services. 4PL firms are supply chain integrators that synthesise and manage resources, capabilities and technology. 4PL® firms are not only responsible for the provision of transportation services. Their activities include the full spectrum of supply chain integration services (Chow et al., 2007).

4PL® firms connect and oversee many transport service provider’s logistics and operations over a wide geographical area and they have network synergies that link resources, reducing costs and improving service levels. They can help the customer to focus more on core competencies to better manage and utilise company resources such as inventory and personnel. Companies can optimise their logistics via 4PL®s through vertical and horizontal collaboration that delivers savings (Mason et al., 2007). In particular, 4PL® firms can be used as logistics service providers that help companies to develop and manage optimal reverse logistics (Mukhopadhyay & Setaputra, 2006).

**Reverse Logistics**
In general, it is easy to think of logistics management as the flow of products from supplier to customers. However, from a logistics point of view, the product life cycle does not end with the delivery to customer. The reverse logistics process needs to be managed as well. Many companies are efficient in sales but lack the expertise to handle product returns. According to Jack et al. (2010), an effective reverse logistics capability can help a retailer to improve their overall cost position and returns policy. Reverse logistics is one of the material areas that most firms overlook or consider minor. Almost all companies generate surplus, damaged items and waste materials during their operation processes, whether they are manufacturers, retailers or services organizations. Obsolete, damaged or nonfunctioning products need to be returned to the suppliers for repair or disposal. According to Clendenin (1997), the proper management of the return channel helps companies to sustain a competitive advantage in the same way that a company achieves competitive advantage by integrating the supply chain when optimising outbound logistics.

Reverse logistics is not simply driving the truck the opposite way. When products lack uniformity this has many consequences. The sorting and evaluation of products must be done (Tibben-Lembke & Rogers, 2002). With the call for ‘green’ or ‘eco-industrial’ practices, reverse logistics has been broadly discussed as an important strategy that enables a company to leverage in the eco-industrial revolution that faces global business in the 21st century (Beamon, 1999; Hoek, 1999; Nunes & Bennett, 2010; Zhu et al., 2005). In selecting reverse logistics service providers companies have to consider tangible, intangible, quantitative, qualitative, strategic and operational factors (Meade & Sarkis, 2002). The decision regarding outsourcing of reverse supply chain processes is considered a strategic decision (Ordoobadi, 2009c).

There can be one or more reasons for a company to pursue logistics outsourcing. The ultimate objective is to enhance the overall performance quality in the global supply chain (Wong et. al, 2000). Excelling in a dynamic business environment requires measuring the quality of performance using a comprehensive logistics reporting system.
that can accurately read the market’s pulse. In addition to changes brought about by technology and globalisation, businesses face an ever-changing landscape of frequent mergers and acquisitions (Sun, 1998), competition from parallel and substitute products, and threats from buyers and suppliers. Business competition now includes the time of capturing performance information and this information includes customer feedback. It is important for a company to review, improve and develop a business strategy that reacts speedily to the market and satisfies customers. As a result, firms must have a performance measurement system that provides feedback for timely responses (Lambert & Burduroglu, 2000).

2.4 Logistics Performance Measurement

The productivity of an enterprise is no doubt an important performance measure. However, customer demand propels companies to innovate and diversify in order to grow, and businesses have become more complex. Productivity alone has thus become an insufficient measure of business performance. Craighead et al. (2007) reports that the logistics discipline continues to evolve and become increasingly recognised as a key area within organisations. Chow et al. (1994, p. 23) argue that ‘logistics performance may be viewed as a subset of the larger notion of firm or organisational performance’. The latter has attracted a large volume of diverse research over the years (Caplice & Sheffi, 1995; Stainer, 1997). A major international survey finds that the respondents in manufacturing companies consider supply chain performance is either important or very important for the company to achieve competitive advantage (Forslund, 2007). Four ways in which developing logistics performance measurement can be used to advantage are as follows (Beatham et al., 2004):

1. **Checking position** – Checking current situation against benchmarks and monitoring continuously the performance over time.
2. *Communicating position* – This can be a means for an organisation to market themselves, as well as requiring the release of annual reports and constructing safety statistics.

3. *Confirming priorities* – The performance measurement data helps an organisation to identify shortfalls and understand what is important to the business. It provides insight for an organisation to rationalise and focus on priorities.

4. *Compelling progress* – The performance measure helps an organisation to identify and focus on specific issues. It provides insight into ways for continually improving performance. The priorities communicated by the measures can form the basis for reward.

Systems have been developed to support the logistics performance measurements of organisations. Below are some of the major systems that will be discussed in subsequent sections:

- time to market
- balanced score card
- key performance indicator
- total quality management
- business process re-engineering
- just in time
- customer experience
- activity base costing
- cost management

### 2.4.1 Time-to-Market (TTM)
After World War II, business competition focused on cost, marketing and innovation. In the 1970s, Japan brought products to market which competed not only on cost but quality and reliability. In the late 1980s, Western firms recognised that, in addition to cost, the factors they needed to focus on in order to be competitive included customer needs and services. Time-to-market (TTM) became a focus for achieving customer service and a competitive edge (Pawar et al., 1994). Speed and agility in responding to customer needs became one of the main pillars of competitiveness and has been widely discussed (Youssef, 1995; Blazevic et al., 2003). TTM does not merely relate to finished product delivery to the customer. It is a performance measure which considers total lead time for the entire production process, especially for new product development. It starts with market research, and includes product design, product introduction and decision-making, and the manufacturing system (Bhattacharya et al., 1996; Cooper, 1994; Barczak & Sultan, 2001; Baguley et al., 2006). At every single step errors can threaten success. The identification, optimising and integration of contributory elements throughout the production processes can produce significant cost and time benefits. Brooks and Schofield (1995) list eight contributory elements which need to be addressed:

- the time to harness appropriate technologies
- the time to understand market needs
- the time to establish concepts that are technically and commercially sound
- the time to develop concepts to a functioning and producible design
- the time to mobilise manufacturing facilities and processes
- the time to ramp-up to production volumes
- the time to deliver and fulfill orders
- the time to maintain or service a product

Business processes are cycles that keep repeating. Effective management compresses the cycle time to increase flexibility, improve responsiveness, improve customer service, lower inventories and increase cost savings (Chang & Kleiner, 1997). The proponents of shortened cycle times contend that success in such efforts will lead to improved
profitability, increase market share and higher levels of customer satisfaction (Chen & Kleiner, 2001).

The measuring and proper management of TTM and total processes cycle time are essential but have to be seen as part of a larger picture. Grubb (1998) describes using cycle time management to drive improvements in manufacturing processes, and argues that it is an outstanding and effective method for improving productivity and profitability. However, it is critical to avoid viewing any business process as operating in isolation. To cope with the ever-changing business environment, companies have to adapt any processes and accept any benchmarking standards that will help them in not only doing things right but also doing the right thing (Punniyamoorthy & Murali, 2008). It is crucial for companies to have a comprehensive operational performance measuring system and a strategic management system. A balanced scorecard (BSC) can provide both.

2.4.2 Balanced Score-Card (BSC)

In general business practice, the traditional methods of measuring performance focus on financial indicators. However, financial measurements are lag indicators. They report the consequences of past performance. Many organisations are realising that the traditional financial orientation of their performance measurement system is no longer adequate. It places too much emphasis on pure profit measures and too little on the customer, staff, risk of process and control aspects of the organisation’s operations (Amaratunga et al., 2002). Financial performance is tangible and can be measured and reported with actual data. In contrast, there are non-financial competitive elements of the business process that need to be measured and are intangible. The quality of services, capability of employees, intellectual capital, service reliability, responsiveness, efficient and adaptable business processes are intangible assets. They are all imperative but are not listed on a balance sheet that reflects the real worth of a company or enterprise to the employees and shareholders (Chavan, 2009). In today’s complex and dynamic business environment companies need to anticipate and measure future performance. An innovative measurement model, the ‘balanced score-card’ that measures organisation performance is
first presented in 1992 (Chavan, 2009). The balanced score-card approach to provide a coherent set of performance measures through a comprehensive network. The measurement result can translate as the performance of a company on achieving its strategic objectives. Compared to other frameworks, the biggest strength of the balanced scorecard is the ability to link up different classes of financial and non-financial, internal to external business performance. Punniyamoorthy and Murali (2008, p. 420) state that:

The balanced score for balanced scorecard provides a single value by taking into account all the essential objective and subjective factors – be it financial or non-financial. It also provides a suitable weightages for those parameters. The target performance and the actual performance are compared and the analysis is made.

All BSC measures are aligned with strategy. The link to strategy is subtle, but powerful. BSC measures the performance of the strategy implementation status against pre-determined objectives, without sub-optimisation and encourage behaviours consistent with the strategy (Thakkar et al., 2007). The BSC provides solutions to managers for managing the business from four perspectives: financial, customers, internal, and learning and growth (Amaratunga et al., 2001). It helps the managers consider innovatively the intangible factors that have been traditionally considered as immeasurable. According to Hepworth (1998, p. 560),

The term ‘balanced scorecard’ reflected the balance between short- and long-term objectives, financial and non-financial measures, lagging and leading indicators, and external and internal performance perspectives.

BSC has evolved to be a proven management system, from an innovative measurement system that has been applied in the United States successfully across many diverse industries and the public sector. The added value of the BSC is that it draws together all the key business areas and identifies and exploits the linkages that deliver success (Hepworth, 1998).
If companies are to design fully effective performance measurement systems, management has to determine precisely what performance information needs to be measured. To do this, management has to review the organisation’s objectives and strategic plans in order to establish its key goals. Management then needs to establish what the company must do to meet these goals by identifying the organisation’s critical success factors (CSFs) (Brown & McDonnell, 1995). In other words, management can filter out extraneous data and report at an appropriate level of aggregation to identify the key performance variables (Bond, 1999). The measuring of Key Performance Indicators (KPIs) and benchmarking the best practice in the market can help management to improve its decisions so as to achieve strategic goals.

### 2.4.3 Key Performance Indicators (KPIs) and Benchmarking

Effective organisational management requires data capture and analysis to benchmark best practice in the market in order to support strategic decision-making. Besides external and market best practice, management has to understand internally how managers measure the operational performance of the business processes and create the efficiencies and continuous improvements that ensure competitive advantage (Gulledge & Chavusholu, 2008). Generally, financial terms are measured solely to reflect the performance of business firms. With the development the KPI concept, firms have also started to measure performance in non-financial areas and this increases the number of measures deployed (Beatham et al., 2004). Organisations need to identify critical measures of performance to continuously monitor their operations because there are a relatively small number of critical dimensions which contribute most to success or failure in the marketplace.

The critical dimensions, also named as KPIs are defined differently by different authors. Chakrabarty and Chuan (2009) describe KPIs as performance metrics of key process input or output variables. To measure the KPIs of an organisation effectively, management has to establish methods to prioritise and review their critical dimensions. Shahin and Mahbod (2007) suggest the prioritisation of organisational KPIs has to be
SMART (Specific, Measurable, Attainable, Realistic, Time-sensitive). They explain that KPI prioritisation is needed owing to the size and complexity of organisations. Size and complexity can affect the types and numbers of KPIs selected. Thus, it may not be justified on cost effectiveness to invest in the analysis and improvement of all KPIs. There are different kinds of KPIs for measuring the performance in the areas of operating cost, quality of work and on-time delivery that reflect the organisation’s effectiveness (Gulledge & Chavusholu, 2008).

It is not unusual for customers to set certain KPIs to measure Logistics Service Providers’ (LSP) performance such as ocean and air freight companies. By reviewing their KPIs, companies can identify areas and develop action plans for continuous improvement. However, the researcher believes the identification of improvement areas does not merely apply to LSP performance, but to the entire logistics flow and network. Logistics operations are part of the network that integrates seamlessly to logistics services providers operations. The measurement of logistics suppliers’ performance is imperative for organisations to select the most important and relevant ones. There may be one or several KPIs for each critical success factor (CSF). The measurement of KPIs has to include CSFs that are set to be constant or identical, and they can be expected to change over time. According to Sinclair and Zairi (1995), an effective KPIs should include:

- a title
- data used in calculation
- calculation method
- the sources of data used in calculation
- frequency of measurement
- responsibility for the measurement process

The development and measurement of KPIs aims to support companies to review how they are performing through the benchmarking of the best practices in the market. To remain competitive, firms need to benchmark the best practices in the marketplace for
effective strategy development. Benchmarking is a management technique that helps organisations and individuals to learn and develop to achieve business improvement (Fernandez et al., 2001). Zairi and Youssef (1996) identify three distinct types of benchmarking. They are internal, external and best practice.

Benchmarking can help an organisation to be aware of the industry best practice; know how to base on a holistic view of the external conditions to set objective; identify valid productivity measures, and meet end-user customer requirements (Zairi & Youssef, 1995). Based on the selected benchmarking information, firms can proceed with a four-phase continuous improvement cycle approach of plan, do, check and act (PDCA) to resolve performance issues and drive continuous business processes improvement (Sarkis, 2001).

The objectives of developing KPIs for benchmarking are to provide critical paths for organisations to continuously monitor and adjust the internal processes. It helps an organisation to develop new competitive business strategies to achieve the ultimate business goal. The measurement of KPIs and benchmarking mirrors some of the concepts underlying Total Quality Management (TQM) in that management attempts to develop a continuous improvement mechanism to monitor performance and achieve zero defects in its business processes (Broderick et al., 2010).

2.4.4 Total Quality Management (TQM)

For all types of organisations, including manufacturing firms, service providers and public sector organisations, quality is improved and costs are minimised through reductions in failure costs. The absence of quality assurance problems removes the need for non-value adding operations devoted to dealing with failure and waste, and delivery performance benefits from increased output and higher productivity (Ho & Fung, 1994). The work of implementation for an organisation should begin with the identification of
core values that should characterise the organisation. Hellsten and Klefsjo (2000, p.243) state that:

Total Quality Management (TQM) is a management system consisting of three interdependent components: values, techniques and tools. Techniques and tools support the values and together they form a whole.

TQM began in the United States in the early 1980s, as a general business philosophy that can be applied to all facets of the enterprise, including manufacturing, marketing, and logistics. TQM focuses on an entire organisation from management to all employees, on providing products or services to maximise customers’ satisfaction by the design of a broad set of management and control processes. TQM is customer-focused. All participants of a TQM organisation strive to manage the continuous improvement of the organization process control, improvement and assurance of product quality (Talha, 2004).

In a study of TQM elements, Fotopoulos and Psomas (2009) describe continuous improvement (CI) as the most important ‘soft’ element of TQM. The TQM approach stresses long-term benefits resulting from continuous improvements to systems, program, products, and people. Improvements most often result from a combination of small innovations. A structured, disciplined operating method is used to maximise customer service levels. Performance management efforts focus on group-level appraisal and rewards will have a greater positive effect on TQM implementation efforts than focusing on individuals, especially at lower hierarchical levels (Waldman, 1994). TQM is not only relevant to the continuous improvement of physical production of goods and services. TQM creates an interface between the corporate and business sectors, and the operational and functional levels by linking both the formal quality control processes and the broader organisation-wide processes to the strategic issues (Murray & Chapman, 2003).

The key for TQM success is to focus on continuous improvement that leads to higher quality and better customer support from sources that are both internal and external to the
organisation. The most important point is that TQM requires employee involvement to be successful. Without employee involvement, focus cannot be achieved. Top management commitment and leadership is imperative to ensure follow through on employee recommendations. Commitment at all levels enables the organisation to work (Dimitriades, 2000). TQM has been demonstrated to be an effective management system, with the potential to make a major contribution to changing human behaviour (Page & Curry, 2000). The successful implementation of TQM needs cultural transformation. The absence of a cultural transformation on the part of management and individual members of the workforce in terms of style of management, behaviour and attitude towards work can lead to the failure of TQM (Nwabueze, 2001).

TQM is a revelation for many firms that link the current customers’ needs and the quality of the product offered. Nevertheless, any process that encompasses an extended time-span needs to be reviewed to ensure its ability to cope with changes to customers’ needs. TQM has application to incremental improvement, but is of little value in supporting major changes. Over the years, TQM has come to mean many things to organisations, some of which are getting less enthusiastic about the impact of TQM in their operations. They are looking in a different direction to solve their problems.

### 2.4.5 Business Process Re-engineering (BPR) and Continuous Improvement (CI)

The concept of process re-engineering was introduced in the 1990s as a way to improve organisational performance (Burke, 2004). In a study of organisational culture, Gore Jr (1999) explains that both TQM and BPR focus on process flows, customers and work to define the current process and identify problems. The elements that are missing from TQM are continuous improvement, a focus on people, participation of insiders, and teamwork. It is these elements that make up the central difference between the two approaches. There is increasing focus on the effect re-engineering has on employees, and what is required of management to stabilise the process and maintain gains. A business organisation’s objective is not only to beat the competition but also need to maintain
profit growth. Continuous improvement should be a way of corporate life in today’s business environment. The new products and services developed must be on target precisely at any time. Business process redesign with greater flexibility and innovation are crucial (Zhang & Cao, 2002). Tennant and Wu (2005, p.538) state that:

BPR has been popularised as one of the current major techniques of change management within organisations, and companies that have implemented reengineering successful have reported that the benefits they gained included – quality and productivity improvement, production cycle time reduction, more profits and improved customer satisfaction.

Wong and Li (1998) mention in a case study of BPR in an international company that since BPR is introduced in the 1990s, hundreds of companies all over the world have ventured to re-engineer their processes. Many of them claimed to have completely change their way of doing business and have achieved quantum levels of improvement. The benefits gain from BPR include improve technology, increase efficiency, reduce costs, better defined strategic focus, improved customer services, quicker responses to competition, more compliance with regulations and quicker adaptation to the changing market. In contrast, there are many reasons for the possible failure of BPR implementation. Some failures arise from management’s inability to identify the critical problems to be solved by re-engineering. However, the most common problem is the failure of managers to anticipate and address the widespread fear of change (Marjanovic, 2000).

The implementation of BPR is not a standalone review of any individual operation element. It reviews comprehensively the organisational structure, empowerment, training and IT system because any modification on each of the element can influence the others. Furthermore, the implementation of BPR by an organisation is to achieve the maximum long term benefit by adopting robust strategic planning and process management techniques. It is imperative for organisations to develop an improvement strategy prior to BPR implementation to minimise the risks of failure. Tennant and Wu (2005) suggest
that managers should develop a strategy to improve organisational performance before applying BPR to redesign processes through the following:

- prioritising application of BPR business processes according to the strategic goals
- developing appropriate company-wide BPR objectives and measures
- emphasising continuous improvement for the long instead of the short term
- developing effective and appropriate communication channels based on self-assessment
- not focusing on downsizing but understanding the needs of employees
- encouraging people’s involvement; co-ordination; and appropriate technologies; and by developing an appropriate reward system

Siha and Saad (2008) mention that the practice of BPR is found to be successful in the United States and Europe. The key drivers are questioning the fundamental assumptions of a process, aligning the process with corporate strategy, improving drastically the process, and using communication and information technologies effectively. Among various successful cases in BPR, there is one model that demonstrates the key drivers mentioned and has attracted almost all BPR research scholars’ and market practitioners’ interest. The model is Just-In-Time (JIT).

2.4.6 Just-In-Time (JIT)

The basic concept of ‘just-in-time’ (JIT) was first introduced by Taiichi Ohno, executive vice-president of Toyota Motor Company and implemented in Toyota in the early 1970s. The JIT concept spread rapidly to other Japanese companies, and by the early 1980s, JIT became a very popular manufacturing innovation in many Western and Asian countries (Kazazi, 1994). JIT is now one of hottest topics in manufacturing management improvement, and has attracted many discussion about its application and benefits for other industries and services (Germain & Droge, 1995; Waters-Fuller, 1995; Lehtonen & Holmstrom, 1998; Pheng & Chuan, 2001).
JIT can be defined as an operating concept designed to eliminate waste. Canel et al., (2000, p.51) state: “Waste is anything other than the minimum amount of equipment, materials, parts, space, and worker’s time which are absolutely essential to add value to the product or service”. Besides focusing on the elimination of waste and the striving for ongoing improvements, the philosophy aims to support manufacturers to produce a variety of products with a minimum of inventory, and to minimise quality defects.

JIT implementation brings many operational benefits for manufacturers that include the reduction of work-in-progress inventory; reduction of floor space required; reduction of production lead time; increases in worker productivity; increases in inventory turn; and minimising inventory buffer stock. The continuous improvement approach aligns with the TQM concept and helps the company to identify problems and develop solutions (Hum & Ng, 1995; Aghazadeh, 2001; Yang & Deane, 2002).

In one study of JIT implementation in the Scottish electronics industry, Mould and King (1995) explain that JIT implementation requires a smooth changeover, with careful planning and prioritisation. JIT implementation can be set up in two stages. Stage one is concerned with preparing the plant for a flow of production, flexibility, short lead times and high quality. Stage two builds on stage one and allows the plant to operate in a JIT manner, with short lead times and little waste. In addition, according to the conclusion of Yasin et al.’s (2001) research on JIT implementation in the public sector, there are three issues organisations should consider in order to enhance the potential success of JIT efforts:

1. Training of management and employees in order to create an organisation culture that consists with JIT philosophy;
2. Establishment of new procedures based on the criteria setting of quality, cost and timing when dealing with suppliers.
3. Identification and performance analysis for areas where standardisation, simplifications and automation are needed. Based on the analysis to re-engineering the operational processes and procedures prior to the implementation of JIT.
One survey of one-hundred firms finds that top and middle management demonstrate a high commitment to actively pursuing JIT implementation. The barriers in JIT implementation are found to be lack of functional support, especially from engineering, finance and marketing (Giunipero & Law, 1990). This reflects the fact that the total organisational support for JIT implementation is extremely important. The effective implementation of JIT can support an organisation to develop ‘world class manufacturing’ (Flynn et al., 1997).

JIT implementation has limitations. One limitation of JIT is cultural differences. It is difficult for many organisations to adopt new methods because of the prevailing organizational culture. Another limitation is the traditional approach of having plenty of inventory on hand to cover ordering or product mistakes. JIT implementation creates a negative source of pressure on the participating individuals because of inventory minimisation. In addition, the loss of autonomy of individuals and teams puts more stress on them as they only have a set amount of time to do certain tasks. Therefore, the building of mutual understanding and trust must be achieved to have complete satisfaction with working across the organisation to each of the individual units (Aghazadeh, 2004). With previous discussions on JIT focusing on an organisational improvement in internal areas such as production and purchasing, the JIT concept has been examined by researchers to extend ways in which it can improve customer orientation (Claycomb et al., 1999).

2.4.7 Customer Experience

In a business process, outputs should be products for customers (Abdolvand et al., 2008). Most internal and external operational activities in business organisations have the ultimate objective of satisfying the customer’s needs, and in return obtaining sustainable profits. Organisations have to understand the customer’s ever changing demands, so that the organisation can continuously develop appropriate products and services to satisfy them. Flanagan et al. (2005, p.374) argue that:
Satisfaction is an important consumer-based construct. Satisfaction is the result of a customer’s assessment of a service based on a comparison of their perceptions of service delivery with their prior expectations.

Today’s companies present a strong contrast to the old idea of creating the product and then presenting it in the most effective way to convince the customer to purchase it. They now view the customer as the starting point and hold that outstanding customer service is an important determinant of competitive advantage among businesses (Mouawad & Kleiner, 1996). Satisfying customers is not a short-term strategy. To keep and understand customers, companies need to know more about them. Customer relationship management (CRM) development has been an important trend that helps organisations to improve customer retention and build customer loyalty (Johnson et al., 2008). However, it seems insufficient for an organisation to manage only the relationship with customers. Managers have to think about the development of a stream of experience over time to achieve a sustainable competitive advantage (Palmer, 2010). In one study examining service experience and post-consumption evaluations the authors concluded that competitive success depends on satisfaction with the service experience (Grace & O’Cass, 2004). Understanding the service experience, how customers feel about the service and whether they are satisfied or not are vital in the development of sustainable competitive advantage.

Customer experience is an intangible, essential and intrinsic value that a company considers to develop products or services from customer’s point of view. Particularly in the service industry, it is imperative for organisations to deliver appropriate service experiences to customers. Service providers have to explicitly focus on each service encounter in designing service experiences. It is essential for service providers to develop customer expectation management to design proper experiences. Different customers in different situations will generate different kinds of expectations. Most customers evaluate the service quality that they receive in ways that are influenced by their prior expectations. Expectations are the result of many factors, a range of which are outside the direct control of service operators. Therefore, experiential factors do affect expectations.
(Johnson & Mathews, 1997). Understanding the desires and expectations of customers is important for achieving high customer satisfaction. Considering the importance of customer expectations leads to high-quality services and experiences (Hsieh & Yuan, 2010).

In general, the expectation of most of all customers is to pay the suppliers for the products or services that offer the best value. From a supplier’s perspective, value can be internal and external. Internal value is ‘wealth’ to shareholders and external value is customer ‘satisfaction’ (Bititci et al., 2004). These contributions require effective Quality Management (QM). It is imperative for all organisations to review and tightly control costs and expenditure to maintain an effective QM in current economic conditions (Laszlo, 1999). According to the business strategy developments discussed in previous sections, cost control is fundamentally the key factor. Activity Based Costing (ABC) is one of the essential approaches helping organisations to control cost.

2.4.8 Activity Based Costing (ABC)

The rapid development of IT has moved the traditional manufacturing environment to computerised automation. Activity Based Costing (ABC) systems focus on all the activities in production process that perform to product products. It traces costs and pinpoints areas of waste based on each product’s activity performance. ABC identifies products or services that do not directly consume resources; they consume activities. Thus, methods used to trace costs in ABC systems are different from traditional cost accounting systems (Helberg et al., 1994; No & Kleiner, 1997; Goldsby & Closs, 2000). ABC identifies the actual consumption of cost and resources that are apportioned to products in the activities starting from production, marketing, selling, delivery and after-sales services. Thus, the interdependencies of cost drivers and activities can be recognised. ABC is initially a method of cost calculation that provides information to management on where the most important costs occur and what produces them (Gunasekaran et al. 1999b). More specifically, ABC measures the time spent by each individual in an organisation in work activities. It converts the individual average time
spent into cost data, and then allocates relevant labour costs to each activity. Ultimately, all activity costs are associated with a specific product or service across individuals and even departments, and are added together in terms of total time spent on core processes for the specific product or service (Driver, 2001).

Since ABC approaches differ from traditional costing systems, organisations need to identify some key areas that they have to set up and put resources into in order to implement successfully the new costing system. According to Sohal and Chung (1998), the following ingredients are organisations need to address on ABC implementation:

- total commitment from top management
- the establishment of a multi-disciplinary project team to introduce and implement the system
- education and training of all people in the organisation to understand the complexity of the new system and its impact
- adequate resource allocation to the project implementation
- access to outside expertise, especially for development of new concepts and software
- ongoing feedback to all level of the organisation includes top management and lower level employees the progress of the project
- keeping the implementation as simple as possible

ABC has been found to be more appropriate for capital intensive manufacturing environments. The benefits of ABC implementation to organisations can include targeting cost reduction through the justification of cost against product value (Bayou & Reinstein, 1998); measuring performance by evaluating the cost against an activity’s efficiency; supporting management to make decisions on product pricing and profitability; providing relevant information to management on setting and using of overhead budgets; and applying costs to objects other than the product. Management can identify the costs associated with the serving of individual customers such that they can evaluate the profitability of doing so to obtain a better view of how profit has been earned.
(Gunasekaran, 1999). Instead of replace traditional accounting systems and records, ABC attempts to capture the allocation of the activity’s costs for specific areas. It identifies further the data aggregated in traditional accounts into a more advantageous decision-making for managers (Lin et al., 2001). Therefore, organisations need to have a comprehensive and effective strategy to manage and control costs from a total cost management perspective.

2.4.9 Cost Management

An effective and comprehensive cost management system helps companies to utilise their valuable resources for producing quality goods and services by providing accurate and useful information. Organisations that consistently and persistently manage their cost structures can be the achievers. It appears that an effective supply chain alone will ensure adequate customer satisfaction through reducing costs, and ultimately prices. Simultaneously, it will also meet shareholder expectations for profitability, and share price growth with dividends (Walters, 2006).

Groth and Kinney (1994) argue that cost management begins with capturing which events trigger costs. An effective cost management effort can only be successful after identifying activities that generate costs. Management can only control costs by altering or changing the nature and extent of the activities that create them. Traditional accounting, activity-based accounting, and constraint-based accounting are the three most prevalent approaches to cost management (Lockamy III, 2003). Each of these approaches manages organisations’ costs with different objectives. Although a hybrid approach to cost management provides improvements over the traditional approach, a comprehensive strategic cost management system is needed for a firm to simultaneously assess its customers, review its resources, and finance situation that are able to achieving the goals, objectives and strategies.

Cost management generally takes one of the three forms: cost containment, avoidance and reduction (Norek & Pohlen, 2001). Organisations must be very clear about the
internal costs of their operations and the costs of serving their customers. Cost knowledge will enable an organisation to improve its relationships with customers. It helps to improve internal budgeting and pricing accuracy. Particularly in negotiations, the accurate cost identifying is crucial in pursuing a strategy of either low cost or differentiation to achieve sustainable competitive advantage.

The conventional view of managers is that quality is related to incurring costs. The higher the cost incurred in manufacturing processes, the higher the quality of products. Practically, the most pervasive understanding of quality in manufacturing organisations is that the attribute or variable of interest is design specification and tolerance limits, that is the conformance quality (Balachandran & Srinidhi, 1996). The reality in manufacturing is that around 70 per cent of the cost of any product is dictated by decisions made during the design and early manufacturing process development phases (Meeker & James, 2004). Therefore, the most effective way to gain the levels of cost and quality desired is for organisations to look at a product’s design and its production from the viewpoint of cost and quality, preferably as early in the development process as possible.

Quality management and cost are causally related. Ramudhin et al. (2008) suggests that organisations incorporate the Cost of Quality (COQ). They explain that most supply chain models employ some form of a cost variable, and it would be advantageous if a cost indicator for quality can be incorporated into the supply chain. They argue that quality costs can be categorised into prevention, appraisal, and failure costs. COQ is a cost indicator. The supply chain network design incorporating COQ helps to reduce the probability of defects to ensure the lowest overall cost, because corrective actions might increase additional cost.

Agrawal et al. (1998) provide an overview of cost management and argue that it requires a commitment from the top management. What is required is the involvement of all levels of workers, as well as a perpetual improvement system that helps organisations to improve value-adding activities and minimise non-value-adding activities. An effective cost management system may incorporate all the available strategic management systems
such as activities based costing, total quality management, just-in time, processes re-engineering, and reliable information for management decision-making. Cost management systems can help organisations to maximise their profits in all types of businesses. In particular, in some industries such as the apparel industry where production is labour intensive, it is difficult to develop market differentiation.

2.5 Vendor Logistics Performance Measurement

Byus and Lomerson (2004) suggest that organisations must continuously improve the performance of their operations for the overarching purpose of creating and maintaining satisfied customers. This requires not only the adoption of the principles embodied in the marketing concept but also performance measurement methods that capture the consequences of such adoptions. Pegels and Yang (2000, p. 97) suggest that ‘The performance measure used is relative efficiency in converting the firm’s strategic assets into firm performance measured by returns on investment and returns on sales’.

In a study regarding the contribution of production competence to business performance, Avella and Vázquez-Bustelo (2010) argue that the manufacturing function significantly contributes to business performance. The study findings are consistent with previous research, which finds that production competence is a determinant of business performance. They find that approximately 10–12 per cent of total variation in sales turnover and eight per cent of total variation in return on assets (ROA) performance can be attributed to production competence. Therefore, it is useful to analyse the effect of choosing a specific business strategy on production competence and on business performance in order to ascertain whether there are any differences amongst manufacturers with regard to differentiation or cost leadership strategies.

In the apparel industry, performance measurements can be of various types. Jang et al. (2005) find that the performance of apparel products relies more on product-level and firm level. Product-level measures measure cost efficiency, product value for customers,
style mixes of the line, and excitement. The product’s contribution to a firm’s business and brand building emerge under the firm-level measure.

In a study of the estimation of total factory productivity, Joshi and Singh (2010) explain that productivity is the driving factor for enhancing the competitiveness of any decision-making entity. They recommend the measure of total factor productivity (TFP) in garment-manufacturing firms to enhance their productivity. Phusavat et al. (2009) also identify a set of circumstances that requires productivity information as well as when to measure productivity by linking with manufacturing and supplier-selection strategies.

To and Leung (2001), in the conclusion to a study on the service quality of apparel manufacturers, mention that conventional apparel sourcing and procurement practices focus on production constancy and economies of scale. Manufacturers’ offers are characterised by their competence, which entails a high level of production expertise and technical judgment. Manufacturers may therefore be inclined to be more operation-oriented than client-oriented. They should be more aware of the issues of quality, which international buyers will consider in evaluating their service.

In the apparel industry, quality is one of the important topics that has long been broadly discussed in various areas of the trade including fabrics, ladies’ and children’s garments, and the appearance of garments (Geršak, 2002; Inoue et al., 2000; Tongue et al., 2010). The conventional measurements of apparel manufacturing performance are more focused on cost, productivity and quality. Since some new strategic business concepts have developed, the performance of apparel manufacturing organisations has been measured in various strategic perspectives. Some authors suggest implementing ISO and TQM to measure apparel manufacturing organisations’ performance (Thaver & Wilcock, 2006; Kapuge & Smith, 2007; Das et al., 2008). Bititci et al. (2000) and Jin (2006) suggest making use of IT to measure the performance of the apparel supply chain.

In recent decades with the rapid development of the total supply chain management concept, there have been broad discussions regarding the performance measurement and
improvement of apparel suppliers from a total supply chain perspective (Au & Ho, 2002; Christopher et al., 2004; Hull, 2005; Lee & Kincade, 2003; Manzini et al., 2005; Rollins et al., 2003). For logistics management, researchers cited some literature related to the discussion of logistics performance measurement, matrix development and benchmarking (Caplice & Sheffi, 1994; Daugherty et al., 1994; Tracey, 1998) but most are conceptual and generic. The empirical studies relevant to logistics operational performance, especially in the apparel industry, are scarce.

2.6 Chapter Summary

Logistics services are imperative for supporting the transition to agile manufacturing that is centered on the links within the entire organisational network (Vastag et al., 1994). It is best to adopt a wide perspective when developing a supply chain strategy. It provides significant potential benefits but simultaneously requires trading partners to think and act strategically (Power, 2005). This chapter provided a review of the literature on apparel industry sourcing development; vendor selection; logistics management; types of logistics services; the trend of organisations’ outsourcing logistics to third party and fourth party logistics service providers.

Section 2.2.2 discussed how logistics is now one of the top criteria for customers to evaluate and select vendors. The review extends to logistics performance measurements that incorporated organisations’ business strategies and various topics including time to market, business score cards, key performance indicators, total quality management, business process re-engineering, customers’ experiences, and cost management. The measuring of vendors’ performance is vital and has been brought to the attention of multinational organisations.

This chapter provides a review of the literature covering five key areas: global apparel sourcing development; logistics management; logistics performance measurement; and vendor logistics performance management. With the dramatic growth of apparel sourcing activities in Asia, the development and performance of these areas have a significant
impact on the performance of organisations, as they relate intimately with each other. According to the researcher’s observations over the past 20 years working in the Asian apparel industry, many organisations have developed VLPM. However, organisations do not share reviews of the performance results with their partners. In addition, there is no standardised system found in the apparel industry in Asia. Based on the review of the literature and observations of the researcher, a gap in logistics performance measurement of the vendors, customers and 3PL has been identified, as shown in Figure 2.4.

**Figure 2-4 Research Gap for VLPM Development**

![Diagram showing the research gap for VLPM development](Image)

Source: Developed for this research

Figure 2.4 illustrates the VLPM current practice and development of three different sectors in the Asian apparel industry. It should be noted that there is no overlap between the three different sectors. This is because they have been found to have developed VLPM individually, without a standardised system. Also, they do not share and review the VLPM with each other. As such, a research gap has been identified, in that there appears to be no standard for VPLM development in the Asian apparel industry.

Identification of the existing gap underpins the research objective, and the development of the research problem, expressed as:

*Should organisations develop a VLPM tool, and if so, how should they do so?*
Consequently, the research objective is:

*To understand the benefits and requirements of VLPM for an organisation.*

Based on the knowledge gap and the objective identified, the following research questions for this study are:

1. What is Vendor Logistics Performance Measurement?
2. Which are the most important criteria for Vendor Logistics Performance Measurement?
3. What influences the type of VLPM that an organisation requires?
   3.1 How important is it to have specific criteria in the VLPM?
   3.2 How is VLPM shared and reviewed?
4. How important is VLPM for the continuous improvement of an organisation? In what areas does VLPM influence an organisation?

The next chapter discusses the research methodology, procedures and questions designed to resolve these issues.
Chapter 3 – Methodology

3.1 Introduction

This chapter discusses the research paradigm; why it was selected for this study; the methodology used in the research; and presents a justification of the methodology chosen. In this chapter, the research design, procedures and instruments used, and their limitations are elaborated. The chapter also explains the data collection, validity and reliability issues, and ethical considerations. This chapter describes the methodology that will use to collect data that will confirm, or refute, the research’s concept developed in Chapter Two. Figure 3-1 provides a structural map of this chapter.

3.2 Research Paradigm

Collis and Hussey (2003, p. 17) point out that ‘[t]he term paradigm refers to the progress of scientific practice based on people’s philosophies and assumptions about the world and the nature of knowledge’. Neuman (2006, p. 81) extends this definition by saying ‘a paradigm is a general organising framework for theory and research that includes basic assumptions, key issues, models of quality research, and methods for seeking answers’.

A research paradigm has three elements include ontology, epistemology and methodology. In brief, ontology is the fact that researchers investigate. Epistemology is the relationship between the researcher and the fact. The technique used by the researcher to investigate the fact that is methodology (Healy & Perry, 2000). The choice of research methodologies is the acknowledgment of the research paradigm. According to Sobh & Perry (2006), methodology is one of the three elements of a paradigm: Ontology, Epistemology and Common methodologies the researcher either explicitly or implicitly work within.
Table 3-1 provides a summary of the philosophical assumptions of the four conventional scientific paradigms: positivism, realism, constructivism and critical theory.
### Table 3-1 Four Scientific Paradigms

<table>
<thead>
<tr>
<th>Paradigm</th>
<th>Positivism</th>
<th>Constructivism</th>
<th>Critical Theory</th>
<th>Realism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ontology</strong></td>
<td>Reality is real and apprehensible</td>
<td>Multiple local and specific &quot;constructed&quot; realities</td>
<td>“Virtual” reality shaped by social economic, ethnic, political, cultural, and gender values, crystallised over time</td>
<td>Reality is “real” but only imperfectly and apprehensible and so triangulation from many sources is required to try to know it</td>
</tr>
<tr>
<td><strong>Epistemology</strong></td>
<td>Finding true – researcher is objective is viewing reality through a “one way mirror”</td>
<td>Created findings – researcher is a “passionate participant” within the world being investigated</td>
<td>Value mediated findings – researcher is a “transformative intellectuals” who changes the social world within which participants live</td>
<td>Findings probably true – researcher is value-aware and needs to triangulate any perceptions he or she is collecting</td>
</tr>
<tr>
<td><strong>Common methodologies</strong></td>
<td>Mostly concerns with a testing of theory. Thus mainly mainly quantitative method such as survey, experiments, and verification of hypotheses</td>
<td>In-depth unstructured interviews, participants observation, action research, and grounded theory research</td>
<td>Action research and participant observation</td>
<td>Mainly qualitative methods such as case studies and convergent interviews.</td>
</tr>
</tbody>
</table>


Collis and Hussey (2003, p. 53) argue that there are two main paradigms, namely positivist and phenomenological paradigms. Table 3-2 shows the main features of the
two paradigms, and Table 3-3 lists the alternative terms for the two main research paradigms.

Table 3-2 Features of the Two Main Paradigms

<table>
<thead>
<tr>
<th>Positivistic paradigm</th>
<th>Phenomenological paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tends to produce quantitative data</td>
<td>Tends to produce qualitative data</td>
</tr>
<tr>
<td>Uses large samples</td>
<td>Use small samples</td>
</tr>
<tr>
<td>Concerned with hypothesis testing</td>
<td>Concerned with generating theories</td>
</tr>
<tr>
<td>Data is highly specific and precise</td>
<td>Data is rich and subjective</td>
</tr>
<tr>
<td>The location is artificial</td>
<td>The location is natural</td>
</tr>
<tr>
<td>Reliability is high</td>
<td>Reliability is low</td>
</tr>
<tr>
<td>Validity is low</td>
<td>Validity is high</td>
</tr>
<tr>
<td>Generalises from sample to population</td>
<td>Generalises from one setting to another</td>
</tr>
</tbody>
</table>

Source: Collis & Hussey (2003, p.55)

Table 3-3 Alternative Terms for the Main Research Paradigms

<table>
<thead>
<tr>
<th>Positivistic paradigm</th>
<th>Phenomenological paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative</td>
<td>Qualitative</td>
</tr>
<tr>
<td>Objectivist</td>
<td>Subjectivist</td>
</tr>
<tr>
<td>Scientific</td>
<td>Humanistic</td>
</tr>
<tr>
<td>Experimentalist</td>
<td>Interpretivist</td>
</tr>
<tr>
<td>Traditionalist</td>
<td></td>
</tr>
</tbody>
</table>

Source: Collis & Hussey (2003, p.47)

The positivist paradigm is used in the natural sciences, such as biology, botany and physics based on the approach. Phenomenology is the science of phenomena. The phenomenological paradigm developed as a result of criticisms of the positivist paradigm. The assumptions of the two main paradigms are outlined in Table 3-4
### Table 3-4 Assumptions of the Two Main Paradigms

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Question</th>
<th>Quantitative</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ontological</strong></td>
<td>What is the nature of reality?</td>
<td>Accurate and reliable through validity and reliability</td>
<td>Reality is subjective and multiple as seen by participants in a study</td>
</tr>
<tr>
<td><strong>Epistemological</strong></td>
<td>What is the relationship of the researcher to that researched?</td>
<td>Researcher is independent from what being researched</td>
<td>Researcher interacts with that being researched</td>
</tr>
<tr>
<td><strong>Axiological</strong></td>
<td>What is the role of values?</td>
<td>Value-free and unbiased</td>
<td>Value-lean and biased</td>
</tr>
<tr>
<td><strong>Rhetorical</strong></td>
<td>What is the language of research?</td>
<td>Formal Based on set definitions Impersonal voice Use of accepted quantitative words</td>
<td>Informal Evolving decisions Personal voice Use of accepted qualitative words</td>
</tr>
<tr>
<td><strong>Methological</strong></td>
<td>What is the process of research?</td>
<td>Deductive process Cause and effect Static Design-categories isolated before study Context-free Generalisations leading to prediction, explanation and understanding Accurate and reliable through validity and reliability</td>
<td>Inductive process Mutual simultaneous shaping of factors Emerging design – categories identified during research process Context-bound Patterns, theories developed for understanding Accurate and reliable through verification</td>
</tr>
</tbody>
</table>

Source: Collis & Hussey (2003, p.49)

### Quantitative Versus Qualitative

There are significant differences and similarities between qualitative and quantitative research, as listed in Table 3-5.
Table 3-5 Differences and Similarities between Qualitative and Quantitative Research

<table>
<thead>
<tr>
<th>Qualitative Paradigm</th>
<th>Quantitative Paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Concerned with understanding behavior from actor’s own frames of reference</td>
<td>- Seek the facts causes of social phenomena</td>
</tr>
<tr>
<td>- Naturalistic and uncontrolled observation</td>
<td>- Obtrusive and controlled measurement</td>
</tr>
<tr>
<td>- Subjective</td>
<td>- Objective</td>
</tr>
<tr>
<td>- Close to data: the ‘insider’ perspective</td>
<td>- Removed from the data: the ‘outsider’ perspective</td>
</tr>
<tr>
<td>- Grounded, discovery oriented, exploratory, expansionist, descriptive, inductive</td>
<td>- Ungrounded, verification oriented, reductionist, hypothetico-deductive</td>
</tr>
<tr>
<td>- Process oriented</td>
<td>- Outcome oriented</td>
</tr>
<tr>
<td>- Valid real, rich, deep data</td>
<td>- Reliable: hard and replicable data</td>
</tr>
<tr>
<td>- Ungeneralisable: single case studies</td>
<td>- Generalisable: multiple case studies</td>
</tr>
<tr>
<td>- Holistic</td>
<td>- Particularistic</td>
</tr>
<tr>
<td>- Assume a dynamic reality</td>
<td>- Assume a stable reality</td>
</tr>
</tbody>
</table>

Source: Adapted from Oakeley (1999)

Lorraine, Hughes and Tight (2010) explain that, while quantitative research may be used mostly for testing theory, it can also be used for exploring an area and generating hypotheses and theory. Similarly, qualitative research can be used for testing hypothesis and theories, even though it is used mostly for theory generation. Qualitative data often includes quantification (statements such as more than, less than, most, as well as specific numbers), whereas quantitative approaches, often using large-scale surveys, can collect qualitative non-numeric data through open-ended questions. The underlying philosophical positions are not necessarily as distinct as the stereotypes suggest. In general, purely quantitative studies are used to measure specific characteristics through structured data collection procedure, often with large samples (more than one hundred observations), so the results can be projected to the entire population. In contrast, qualitative studies are usually using a very limited sample (eight-twelve) to perform in-depth investigations of an unstructured nature. Individuals are usually sought in focus group (Davis, 2005, pp. 306-307). Figure 17 highlight the nature and potential applications of qualitative and quantitative research.
### Table 3-6 Comparison of Quantitative and Qualitative Research

<table>
<thead>
<tr>
<th>Area</th>
<th>Quantitative</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective</td>
<td>Quantification of characteristics or behavior</td>
<td>In-depth understanding of characteristics or behavior</td>
</tr>
<tr>
<td>Approach</td>
<td>Structured</td>
<td>Largely unstructured</td>
</tr>
<tr>
<td>Sample size</td>
<td>Large</td>
<td>Small (fewer than 12)</td>
</tr>
<tr>
<td>Representativeness to</td>
<td>Yes. If random</td>
<td>No</td>
</tr>
<tr>
<td>population</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interviewer skill required</td>
<td>Moderate to low</td>
<td>High</td>
</tr>
<tr>
<td>Length of interview</td>
<td>Relatively short (generally less than 30 minutes)</td>
<td>Longer (more than 30 minutes)</td>
</tr>
</tbody>
</table>

Source: Davis (2005, p.307)

### 3.3 Research Methodology

A study should select the type of methodology that reflect the assumptions of the research paradigm. Loraine et al. (2010, p. 66) provides ‘a simple list of the research families, approaches and techniques of research’ that gives good reference of researcher to select the appropriate methodology for their research.

According to Collis and Hussey (2003), within the phenomenological paradigm, the research methodologies can be action research, case studies, ethnography, feminist research, grounded theory, hermeneutics, and participative enquiry. The research methodologies for the positivist paradigm can be cross-sectional studies, experimental studies, longitudinal studies and surveys. Figure 3-2 depicts the methodological assumptions of the main paradigms related to the positivist and phenomenological paradigms in the social sciences.
3.3.1 Research Method Selection

In selecting the methods and the methodologies for this research, the researcher examined a range of methods before attempting to start the research. Consideration of quantitative and qualitative approaches, of theoretical and practical aspects of conducting research and of the various methodologies that might be adopted, was undertaken (Butt, 2010). Figure 3-3 depict a range of methodologies representing their related paradigms that can be used from theory building to theory testing. It shows that many methodologies used by researchers underlie a realism research paradigm (Healy & Perry, 2000).

Yin (2009) provides a summary of five research strategies or methods which includes experiments, surveys, archival analysis, history and case study. He also suggests that there are three relevant situations that determine the suitability of the methods, namely:

1) Type of research question

2) Control of the actual behavioural events

3) Focus on historical as compared with contemporary events
Figure 3-3  Methodologies and their Related Paradigms

Source: Healy and Perry (2000, p. 121)

Figure 3-4 depicts the relationships of the three relevant situations with the five research methods.

Figure 3-4 10 Relevant Situations for Different Research Methods

<table>
<thead>
<tr>
<th>METHOD</th>
<th>Form of Research Question</th>
<th>(2) Requires Control of Behavioral Events?</th>
<th>(3) Focuses on Contemporary Events?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>how, why?</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Survey</td>
<td>who, what, where, how many, how much?</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Archival Analy.</td>
<td>who, what, where, how many?</td>
<td>no</td>
<td>yes/no</td>
</tr>
<tr>
<td>History</td>
<td>how, why?</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Case Study</td>
<td>how, why?</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>

Relevant Situations for Different Research Methods

Source: COSMOS Corporation

After consideration of the research paradigm and methodological assumptions as discussed in the previous sections, the identified gap in the literature, and research problem identified in section 2.6, the three situations suggested by Yin (2009) can be applied to this study as follows:

1) The type of research question developed in the study is focused on the study of ‘how’ and ‘why’ organisations develop VLPM.

2) As regards control of the actual behavioural events, the researcher requires no control in accessing actual behavioural events.

3) As regards focus on historical as compared with contemporary events, the researcher collected data by means of interviews with predefined open questions that are focused on only contemporary events.

Consideration of these three relevant situations exposes the characteristics and suitability of the methods to be adopted this research. Thus, case study research was selected as an appropriate methodology for this study.

The nature of this research into the development of VLPM is exploratory, considering that there is no standardised way of assessing VLMP to date. With reference to the three criteria for selecting a methodological framework offered by Yin (2009), as discussed, the characteristics and suitability of the methodology and methods were exposed. Thus, case study research was selected as an appropriate methodology for this study.

### 3.3.2 Case Study Research

Case study research has been one of the most powerful research methods consistently in marketing and operations management (Bonoma, 1985; Voss et al., 2002). It is an appropriate method that holds up well for certain important research when compared to other social science research methods (Flyvbjerg, 2006). Dul et al. (2007, p.4) explain:
A case study is a study in which (a) one case (single case study) or a small number of cases (comparative case study) in their real life context are selected, and (b) scores obtained from these cases are analysed in a qualitative manner.

According to Collis and Hussey (2003), case study is an example of phenomenological methodology that often be described as exploratory research. With reference to Lapan, Quartaroli and Riemer’s (2011) suggestions for the application of case study research, this study aimed to describe the phenomena in apparel industry around practitioners’ interaction in VLPM application and development. The study generated thick, rich descriptions of the research objective via interviews, to examine the development of VLPM in-depth. In case study research, context is important because it draws from multiple sources of evidence to describe a history or current phenomenon. Case study data can be obtained from direct observation, interviewing and from public and private archives. Any fact relevant to the phenomenon is a potential datum (Voss et al., 2002). Consequently, the design for this study included identification of the cases, setting boundaries, developing research questions, using methods of data collection that increase the validity of findings, analysing and synthesising these data in reporting results. In addition to disclosing personal biases, the research use triangulation and member checking to increase the validity of findings.

Within the realism paradigm, preferred for case study research, deductive theory testing and inductive theory building are two major approaches to theory development. Perry (1998) explains that the two processes of induction and deduction are unlikely to be absolutely separate in any research, because prior and emerging theory are always being generated by the data. Figure 3-5 illustrates Perry’s comparison of these two positions, a purely inductive or exploratory position on the one hand, and on the other, a deductive, or confirmatory position. The position preferred by the researcher blends the inductive approach with the deductive approach.
In order to select an appropriate research method, the researcher needs to understand the characteristics and applications of each of the research methods. The knowing of the advantages, weaknesses and limitations is also imperative. Next section will discuss the advantages and limitations of case study research.

### 3.3.3 Advantages of Case Study Research

Case studies are essential and strong when statistical methods and formal models are not appropriate. There are four advantages that case study methods is valuable particularly in testing hypotheses and theory development (George & Bennett, 2005). The four advantages are:

1. high conceptual validity achieving potential
2. able to foster new hypotheses through strong procedures
3. an essential means to closely examine the hypothesised role of causal mechanisms within and between cases
4. capacity to address causal complexity
In addition to the four advantages of case studies discuss above, there are three different strengths of case study research during the process of building theory (Huberman & Miles, 2002). They are:

1) The first strength is case study attempts to reconcile evidence across cases, between cases, different researchers, types of data, and with the literature that increase the potential of create or reframe into a new theoretical vision that arises insight in often.

2) The second strength is by testing with constructs and readily measured, the hypothesis of the emergent theory can be proven false.

3) The third strength is the validity of resultant theory is high. In case study, the theory-building process tied intimately with evidence that the resultant theory is consistent with empirical observation. Thus, the resultant theory is likely to be empirically valid.

Although there are advantages and strength in applying case study on an appropriate research problem, there are limitations and weaknesses as well.

### 3.3.4 Limitations of Case Study Research

According to George and Bennett (2005), it is imperative to distinguish between recurrent trade-offs, limitations, and examples of poor implementation of case study methods, in order to avoid misinterpreting these aspects through statistical methods. The trade-offs include:

- the selected case’s problem
- choice between between parsimony and richness
- choice between making generalisations applicable to broad populations vs achieving high internal validity and good historical explanation of the studying cases
The inherent limitations of case study can be:

- inability to judge on the frequency or representativeness of the studying cases
- weak capability to evaluate the average ‘cause effect’ for a sample’s variables
- indeterminacy and lack of independence of cases

It is often difficult to access to a suitable organisation using case study research. The case study process can be very time consuming. It is difficult to decide the boundaries of study. The study may be focusing on a particular group of individuals or organisation, or it could be interacted with the rest of society because they do not exist in a vacuum. The history and the future of unit of analysis will influence the researcher’s understanding of the present. Without knowledge of what happen before and what may happen in future, it could be difficult to understand the events (Collis & Hussey, 2003). An appropriate case study research design is imperative.

3.4 Case Study Design and Procedure

Hansen (2011, p.121) suggests that: ‘Case study design is considered to reflect a logical sequence that connects empirical data with theoretical development’. The research needs to have a prior view of the general constructs or categories.

The researcher needs to have a prior view of the general constructs or categories on the objective of study, and their relationships during the design of case study. A framework develops to explain the main issues such as the constructs, key factors, or variables to be studied, either graphically or in narrative form (Voss et al., 2002). Yin (2009, p.27) states that “A case study research design aims deal with a logical problem and not a logistical problem.” It is important for a research design that helps to avoid the evidence does not address the research questions. Yin (2009, p.27) suggests five components that are important for case studies research design. They are:
1) A study’s question;
2) Its proposition, if any;
3) Its unit(s) of analysis;
4) The logic linking the data to the propositions; and
5) The criteria for interpreting the findings.

Bonoma (1985, p.204) states that “Case study research should reflect and be sensitive to the context in which management behaviour takes place”. With the focus on understanding the dynamic present within single setting, it is important for a case study research to recognise the important of context (Eisenhardt, 1989). Eisenhardt (1989, p. 533) suggests the following steps to develop a detailed process of building theory (see Appendix I for details of the steps):

1) Getting started to define the research question possibly with a prior construct
2) Selecting cases
3) Crafting instruments and protocols
4) Entering the field
5) Analysing data
6) Shaping hypotheses
7) Enfolding literature
8) Reaching closure

Whichever paradigm a researcher selects, the following issues must be addressed in the process of designing case study research, namely, selection of cases, number of cases, unit of analysis, and analysis of data (Collis & Hussey, 2003; Perry, 1998). These processes are discussed in the following sections.
3.4.1 Selection of Cases

For case study research, the cases do not need to be representative of some population in the same way as sample populations in large-scale hypothesis testing research. Case study research aims to build theory instead of testing a theory. Cases need to be selected that are particularly suitable for illuminating and logic among constructs and extend relationships. The selection of cases for case study methodology is purposeful and uses replication logic. Cases can be selected with extreme situations and polar type which are likely to be replicated or extend the emergent theory (Denzin & Lincoln, 2005; Eisenhardt & Graebner, 2007). In short, the selection of cases depends on the conceptual framework of developed from prior theory.

3.4.2 Number of Cases

There is no precise guide to the selection of number of case (Perry, 1998). Christie et al. (2000, p. 15) suggest that, on the one hand:

…single case study research is applicable when the case is critical or unique or where the research is able to access a previously remote phenomenon; critical for testing a well formulated theory; an exploratory study or pilot study shown to be representative of a large population.

On the other hand, selection of multiple cases provides a purposive sample and opportunity for generalising findings. In addition, the scope of the investigation and the degrees of freedom are increased by including multiple sites. Multiple case studies provide for triangulation of evidence, giving a more rigorous and complete approach as compared with single case study research. Multiple case studies also provide a rigorous methodology for replication logic (Bonoma, 1985; Denzin & Lincoln, 2005; Eisenhardt, 1989; Huberman & Miles, 2002). Although multiple case studies provide comparatively rigorous and generalisable findings, selecting the appropriate number of cases is crucial.
There are different views on number of cases setting for case study research. The literature suggests that there is no ideal number of cases (Bonoma, 1985; Eisenhardt, 1989; Huberman & Miles, 2002; Denzin & Lincoln, 2005). The fewer the number of cases, the greater can be the opportunity for depth of observation, whereas a large number of cases provides a purposive sample and the opportunity for generalisability of findings, and a rigorous methodology for replication logic. According to Eisenhardt (1989, p. 545), the number of cases for multiple case study research can be between four and ten cases. With fewer than four cases, it is often difficult to generate theory with much complexity, and its empirical grounding is likely to be unconvincing. Perry (1998, p. 793) suggests that: ‘In brief, the widest accepted range seems to fall between two to four as the minimum and ten, 12 or 15 as the maximum.

Using multiple cases study enhances the validity and reliability of the study because it provides the opportunity for cross comparison and triangulation of results. By using more than one case study, one can validate stability of constructs across situations. Multiple cases help to minimise observer bias and enhance external validity (Meyer, 2001)

Table 3-7 shows the options suggested by Voss, Tsikriktsis and Frohlich (2002) for the number and type of cases chosen, and the advantages and disadvantages of each choice.

### 3.4.3 Unit of Analysis

According to Collis and Hussey (2003), each of the cases selected is a single ‘unit of analysis’. The unit of analysis is one of the five important components in case study design (Yin, 2009). Collis and Hussey( 2003, p. 68) explain that ‘A unit of analysis is the kind of case to which the variables or phenomena under study and the research problem refer, and about which data is collected and analysed’. The unit of analysis may be an individual, a group, an organisation, or it may be an event or some other phenomenon (Darke et al., 1998).
### Table 3-7 Choice of Number and Type of Cases

<table>
<thead>
<tr>
<th>Choice</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single cases</td>
<td>Greater depth</td>
<td>Limited on the generalizability of conclusions drawn. Bias such as misjudging the representativeness of single event and exaggerating easily available data</td>
</tr>
<tr>
<td>Multiple cases</td>
<td>Augment external validity, help guard against observer bias</td>
<td>More resource needed, less depth per case</td>
</tr>
<tr>
<td>Retrospective cases</td>
<td>Allow collection of data on historical events</td>
<td>May be difficult to determine cause and effect, participants may not recall important events</td>
</tr>
<tr>
<td>Longitudinal cases</td>
<td>Overcome the problems of retrospective cases</td>
<td>Have long elapsed time and thus may be difficult to do</td>
</tr>
</tbody>
</table>

Source: Adapted from Voss, Tsikriktsis and Frohlich, 2002 (p.203)

Given that the main objective of this study was to understand the benefits and requirements of VLPM considered by participants from organisations from three sectors (sourcing company, vendor and 3PL), each organisation constituted a unit of analysis. For each unit of analysis, the participants from organisations from each of the three sector organisations were interviewed to obtain their views in an in-depth manner. Each of the groups from the three sectors can be further considered as different cases for the purpose of cross-case analysis. To clarify, the first unit of analysis was the group of respondents from apparel sourcing companies, the second unit of analysis was the group of respondents from apparel vendors or apparel manufacturing companies, and the third unit of analysis was the group of participants from third party logistics services companies. Each group of respondents within the three units of analysis was considered as a single case.
3.5 Data Collection

The literature review was the major source of secondary data for knowledge gap identification and confirmation of research question validity. The literature reviewed in this study comes from various journals including the *Journal of Marketing Research*, *Qualitative Research in Accounting and Management*, the *European Journal of Marketing*, and the *International Journal of Physical Distribution and Logistics Management*. In addition, books, newspapers and other relevant professional publications were used.

The major sources of primary data for this study were collected using in-depth interviews, which were then used to address the knowledge gaps emerging from the literature review. Rowley (2012, p.263) states that ‘[b]oth research and interview questions can be informed by practice or experience, or by theory or previous research, or, in common with research in practitioner disciplines, a mix of both’. In the literature review, a number of authors, including Vaidya and Hudnurkar (2013), Chow et al. (1994), Simatupang & Sridharan (2004), and Caridi, Perego and Tumino (2013), have studied multi-criteria supply chain performance evaluation. While the researcher understood that the criteria and theory study in this literature would not be fully applicable in this study, given that it focuses on VLPM criteria, the mentioned literature provided good advice for developing the research instrument, which consisted of two list of questions to guide collection of primary data through the interviewing process.

3.5.1 Justification for Semi-Structured Interviews

The data for case study research can be collected by means of interviews, questionnaires, financial data, business plans, memoranda, tolls, organisational charts and other physical artifacts, and observations of managerial or employee actions and interactions. Of these, interviewing was selected as the method for collecting primary data for this study. Interviews are regarded as the primary data-collection technique and the most valuable
and essential source of evidence for a case study project (Lin & Zhou, 2011). Rowley (2012, p. 262) states that interviews are useful when:

- The research objectives centre on understanding experiences, opinions, attitudes, values, and processes.
- There is insufficient known about the subject to be able to draft a questionnaire.
- The potential interviewees might be more receptive to an interview than other data gathering approaches.

As Yin (2009) suggests, interviewing is one of the essential methods and most important sources of case study information.

According to Yin (2009), there are three types of interviews in case study research. One type is the in-depth interview. The researcher can ask key respondents about their opinions of events as well as the facts of a matter. This interview type may take place over an extended period of time. The second type of case study interview is a focused interview. The interview is for a short period of time that may remain open-ended and the interview is conducted in a conversational manner. However, the researcher would follow a set of questions derived from the case study protocol. The third type of interview has more structured questions along the lines of a formal survey. Such questions could be designed as part of an embedded case study. This type of interview is more relevant for a case study of an urban design project, or one that includes a survey of workers and managers. The first type of interview mentioned by Yin (2009), in-depth interview, was selected for this research study. In this type the researcher developed ‘how’ or ‘why’ question that are the guideline for the case studies (Yin, 2009). By following the guidelines, semi-structured with open-ended questions were designed for the interviews.

With regard to the number of interviews, Perry (1998) suggests a PhD thesis requires about thirty five to fifty interviews. A researcher determine the number of participants for the study often influenced by issues of time, cost, and other practicalities. It is imperative to note the areas in which the researcher finds that questions persist. Ideally, the
interviews at different hierarchical levels can be three. However, it is difficult to conducting more than one interview in a small Asian organisation (Perry, 1998).

3.5.2 Interview Participants

In considering the time, cost, availability of the participants, and other practicalities, thirty interviewees were selected for this research. They were either industry associates, management executives, or executives of logistics services companies from the researcher’s past business network. The selected participants were representatives from various logistics and apparel companies, and included logistics operations practitioners, management executives, and executives from third party logistics services companies. However, those who participated in the development of knowledge management programs, organisational strategic management were senior management. Thus, although the number of participants selected for interviewing in this research was relatively small, they were highly representative of the units of analysis.

3.5.3 Interview Instrument and Protocol

The participants were management executives in key positions, best placed to understand their organisations’ VLPM development. It was expected that they could provide more details and insights by means of an interview, than would be provided by filling in a questionnaire. The researcher uses the most commonly used format – the funnel model (Voss et al., 2002) that starts with broad and open-ended question and follow by more specific and more detail questions as the interview progressed. There were two sets of open-ended interview questions developed. They aimed to collect the practical experience from the participants of the sourcing company, the vendors and 3PLs from two different perspectives: how and why customer measure VLPM; and how and why vendors and 3PLs are being measured by the customers. The major questions were developed in the form of a general statement which were then followed by a sequence of sub-questions for further probing. The research questions were constructed to align with
measurement of the variables. This enabled the researcher to maintain focus in the face of a potentially overwhelming volume of data (Eisenhardt, 1989).

With the permission of the participants, interviews were recorded using a digital recording device. This provides a more accurate record than any other method (Yin, 2009). Recording of interviews is often suggested as a means of providing a complete description of the interviewee’s responses and comments. However, because audio recording can inhibit the interviewee, and reliance on audio recordings can prevent the researcher from listening carefully and participating fully in the interview process (Darke et al., 1998), the researcher kept a case study database to store the case data or evidence such as documents, audio records of interviews, and field notes and other observations of the research during data collection activities.

The potential research participants were approached in person via telephone, then a follow-up email was forwarded to each of the participants if they expressed an interest in participating. The duration of each interview was around one hour. Interviews were conducted in private meeting rooms, at the participant’s work place, or via telephone.

3.5.4 Use of Digital Audio Recorder vs Field Notes

One of the features of case studies research is the frequent overlap of data analysis with data collection (Huberman & Miles, 2002). Taking field notes is one of the important means of accomplishing this overlap. The researcher may take field notes during each interviews, to capture whatever impressions might occur during the interviews, and because the researcher cannot predict what will be useful in the future. In addition, writing field notes can help the researcher to learn and identify the differences between cases during interviews. However, with developments in technology, the use of recorders gives an alternative to the researcher writing all the interview notes on the spot. The researcher can review each participant’s input from time to time to perform data analysis accurately from the original source after the interviews. Thus, in this study, instead of taking field notes, the researcher used a digital audio recorder to record the interviews.
3.6 Validity and Reliability

As suggested by such authors as Whittemore, Chase and Mandle (2001), every study has biases and particular threats to validity, all methods have limitations, and research involves multiple interpretations as well as a moral and ethical component inherent in judgments (Whittemore et al., 2001). Therefore, the most important considerations are to determine the validity ideals of a particular study, to employ the optimal methodological techniques, and to critically present the research process in detail. This research addressed the issues of quality and validity by following four tests suggested by Riege (2003), namely: construct validity; internal validity; external validity; and reliability (See Appendix III).

To ensure rigour, a review of the theoretical framework, and testing of the interview questions, was carried out with experienced practitioners and executives. Reliability was ensured by thorough documentation of the research process, in order to establish a case study data base. Construct validity was achieved through a literature review, which allowed for development of constructs, and a chain of evidence base on research data collected from multiple sources was established. A total of 30 company executives from 3 units of analysis (sourcing company, vendor and 3PL) were interviewed. To ensure that the data analysis results reflect correctly the view of each of the interviewees, the researcher prepared the transcripts of interviews, which were then reviewed and revised by the interviewees before the researcher compiled the data for analysis. Triangulation of results from data analysis (Thurmond, 2001) was conducted by comparison of data collected from the research interviews and the literature review.

This study undertook the matching of within-case findings, and that between-cases. The in-case interviewees were grouped by sourcing company, vendor and 3PL respectively. The between-case patterns were identified by comparison between the 3 groups. Internal
validity was achieved by comparison of significant statements by interviewees with results of analysis of the encoded results. This study achieved external validity by the selection of multiples cases and participants, through replication logic and comparison of findings to develop the potential for generalisation.

3.7 Data Analysis

Seven analysis tools for qualitative analysis are suggested by Leech and Onwuegbuzie (2007, p. 563). They are:

- constant comparison,
- keywords-in-context,
- word counts,
- classical content analysis,
- domain analysis,
- taxonomic analysis,
- componential analysis

According to Thorne (2000, p.69):

Constant comparative analysis was originally developed for use in the grounded theory methodology of Glaser and Strauss, which itself evolved out of the sociological theory of symbolic interactionism. This strategy involves taking one piece of data (one interview, one statement, one theme) and comparing it with all others that may be similar or different in order to develop conceptualisations of the possible relations between various pieces of data.

Therefore, ‘constant comparative analysis’ is regarded as an appropriate data analysis method for this study. Data analysis was performed across all collected data to assure the accuracy and reliability of the research results for cross-analysis and external replication.
Triangulation was used to test one source of data against another to strip away alternative explanations and test the hypotheses of the research (Margot, 1991).

3.8 Ethical Considerations

This research project has been approved by Southern Cross University. To ensure the adherence to ethical principles for the research the following steps were taken:

- A letter was sent to each participant to explain the purpose of the study and what questions they are being asked. It explained that the recipient had the right and freedom to withdraw from the research at any time. It also explained the assurance of confidentiality and privacy, and access to research results.
- All participants and organisations were represented by a code that ensured confidentiality and anonymity.
- All research related materials including hard copies and audio records were kept in a safe and secure environment.
- Approval was sought from and granted by the SCU ethics committee.
- A letter was provided by SCU indicating compliance with their code of ethics and research rules and procedures.

3.9 Chapter Summary

This chapter discussed the selection for this research of case study methodology, a necessary and sufficient method that holds up well when compared to other methods in the gamut of social science research methodologies (Flyvbjerg, 2006). Case study is typically be used for theory building, which was appropriate for this study. The study included interviews with participants selected from the researcher’s previous business network in apparel manufacturing and logistics operations. The chapter includes a description of the development of the interviewing instrument and protocol, and discusses ethical considerations.
Chapter 4 – Data Analysis

4.1 Introduction

This chapter presents the profiles of participants in each of the cases and analyses data collected in the interviews. It presents the data covering each of the research questions discussed in Chapter 2, provides detailed descriptions of the cases, background information on participants’ positions, working experience and the business of their organisations. Finally the chapter elaborates the data analysis for each research question. Figure 4-1 provides a structural map for this chapter.

4.2 Description of Cases

As mentioned, the research problem addressed in this study concerns:

‘How and why should organisations develop Vendor Logistics Performance Measurement?’

Thus, the research objective was:

‘To understand the benefits and requirements of VLPM for an organisation.’

The research questions that were developed from the research problem and objective, and which guided the data collection are:

1) What is Vendor Logistics Performance Measurement?
2) Which are the most important criteria for VLPM?
3) What influences the VLPM that an organisation requires?
   3.1 How important is it to have specific criteria in the VLPM?
   3.2 How is VLPM shared and reviewed?
4) How important is VLPM for the continuous improvement of an organisation? In what areas does VLPM influence an organisation?
4.1 Introduction

4.2 Description of Cases

4.3 Background of Participants

4.4 Data Analysis for Research Question 1

4.5 Data Analysis for Research Question 2

4.6 Data Analysis for Research Question 3

4.7 Data Analysis for Research Question 3.1

4.8 Data Analysis for Research Question 3.2

4.9 Data Analysis for Research Question 4

4.10 Chapter Summary
Data collection for addressing these questions involved a case study approach, with interviewing key operators in relevant sectors of the apparel industry in Asia. In total, 30 people were selected and successfully interviewed. They were selected from three different units of analysis, namely, executives of apparel vendors, sourcing companies, and 3PLs. The detailed respondent information can be found in ‘Appendix XIII - Background of the Research Participants’. The 30 people were selected and recruited to participate in the study first by telephone and follow up by email confirmation. They were all known from the researcher’s past business connections. All participants accepted the invitation. However, due the fact that participants from all three sectors were executives, fitting the interview into their tight working schedules was difficult. Ultimately, all thirty participants were interviewed successfully.

With reference to the discussions in Chapter 3, there is no ideal number of interviews to be selected in case study research (Bonoma, 1985; Eisenhardt, 1989; Huberman & Miles, 2002; Denzin & Lincoln, 2005). Although Perry (1998) suggests that a PhD research project requires from thirty five to fifty interviews, in this study, the selection of 30 people was based on the considerations below:

- Costs involved in the arrangement for interviews were considerable.
- The difficulties of interview arrangements with participants owing to their tight business schedules and frequent travel. Some of them are stationed overseas.
- The number of participants chosen from each group was regarded as proportional and representative.

The objective of this research is to focus on VLPM in Asia’s apparel industry, and all participants were therefore selected from organisations within or involved apparel industry operations in Asia. In order to preserve confidentiality, each participant was given a code, as explained in Section 4.3.1. The position of the participants in their respective companies is presented in Table 4-1.
Table 4-1 Position of Participants

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Position</th>
<th>Sourcing Company</th>
<th>Position</th>
<th>3PL</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>V01</td>
<td>Logistics Director</td>
<td>S11</td>
<td>Director</td>
<td>T21</td>
<td>Director</td>
</tr>
<tr>
<td>V02</td>
<td>Senior Shipping Manager</td>
<td>S12</td>
<td>Vice President</td>
<td>T22</td>
<td>Senior Manager</td>
</tr>
<tr>
<td>V03</td>
<td>General Manager</td>
<td>S13</td>
<td>Director</td>
<td>T23</td>
<td>General Manager</td>
</tr>
<tr>
<td>V04</td>
<td>Shipping Supervisor</td>
<td>S14</td>
<td>Vice President</td>
<td>T24</td>
<td>Branch Manager</td>
</tr>
<tr>
<td>V05</td>
<td>Logistics Supervisor</td>
<td>S15</td>
<td>Director</td>
<td>T25</td>
<td>Director</td>
</tr>
<tr>
<td>V06</td>
<td>Senior Manager</td>
<td>S16</td>
<td>Group Vice President</td>
<td>T26</td>
<td>Corporate Manager</td>
</tr>
<tr>
<td>V07</td>
<td>Business Development Executive</td>
<td>S17</td>
<td>Senior Manager</td>
<td>T27</td>
<td>Key Account Manager</td>
</tr>
<tr>
<td>V08</td>
<td>Shipping Manager</td>
<td>S18</td>
<td>Director</td>
<td>T28</td>
<td>General Manager</td>
</tr>
<tr>
<td>V09</td>
<td>Shipping Manager</td>
<td>S19</td>
<td>Project Manager</td>
<td>T29</td>
<td>Director Asia</td>
</tr>
<tr>
<td>V10</td>
<td>Director</td>
<td>S20</td>
<td>Senior Manager</td>
<td>T30</td>
<td>Sale Development Manager</td>
</tr>
</tbody>
</table>

4.3 Background of Participants

The participants are selected with consideration of the need for the proportional representation of different organisations namely a vendor, a sourcing company and a third party logistics service provider (3PL). Figure 4-2 illustrates each participant’s years of logistics management experience to show a mixed and diverse set of participants from each group. A good range of professional and experienced practitioners is chosen in an endeavour to obtain a balanced and representative view.
4.3.1 Code Setting for Research Participants

In Appendix III, the background of each of the participants is presented including the nature of their company’s business; their positions; their years of experience and their roles and responsibilities. Each participant was given a code to ensure anonymity and confidentiality. The codes were constructed as follows:

- For vendor participants: V (for vendor) follow by a number indicating the sequence of interviews in the group starting with 01.

- For sourcing company participants: S (for sourcing company), follow by a number indicating the sequence of interviews in the group starting from 11.
For 3PL participants: T (3PL), follow by a number indicating the sequence of interview in the group starting from 21.

4.4 Data Analysis for Research Question 1

Research Question 1 is ‘What is Vendor Logistics Performance Measurement?’ The question was aimed at starting the interview by examining the understanding each participant’s organisation used of VLPM; the structure and level of importance of VLPM to the organisation; and the participant’s awareness and knowledge on VLPM. Sections 4.5.1 to 4.5.4 present the findings from the interviews and Section 4.5.5 provides an analysis of the data.

4.4.1 Use of VLPM

The interviews began with asking about the participant’s organisation or customers’ use of VLPM. Figure 4-3 shows all participants answered ‘yes’ (100%) to the question whether their organisation had used VPLM. Some of the participants mentioned they do not use VLPM for all customers.

Participant V07 said that only 50 percent of their customers use VLPM. T21 answered that some but not all of their customers use VLPM. T30 replied 90 percent of their customers used VLPM. S11 said they use VLPM but they do not use logistics performance to evaluate their factories. Participant S13 answered that they use vendor scorecards to measure the vendor logistics performance.
4.4.2 Importance of VLPM to Participants’ Organisation

Participants’ were asked to comment on the importance of VLPM to the organisation. It was found that 77 percent of the participants consider VLPM is very important to the organisation, 13 percent believe it is important and 10 percent provided other comments. Below are some of the participants’ key comments:

‘Logistics form just part of the vendor measurement. If we fail only the logistics part, customer won’t kill us’ (V06)

‘General. We are more concern about the measurement of ourselves rather than measurement of the vendor’ (T22)

‘Getting more important’ (T27)
Figure 4-4 presents the importance of VLPM by participants’ groups. Figure 4-5 displays an overall view of the research findings.

**Figure 4-4 Importance of VLPM to Organisation**

![Importance of VLPM chart]

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**Figure 4-5 Overall Participants’ views on VLPM to Organisation**

![Overall participants' view on VLPM chart]
4.4.3 Participants’ Views on VLPM

The previous results indicate that VLPM is not new to any of the participants. They all have experience and practical knowledge in handling VLPM. They were asked to share their points of view on what VLPM means to them. The following are highlights of some of the participants’ views. They reflect the need for VLPM and the values and importance of VLPM to the organisation or to the customers. (See Appendix IV for a summary of the participants’ views on VLPM).

‘A system in place which records all the data in terms of costing, shipping, production quality that applies to all factories. It enables cost comparison that is very critically to benchmark our customers.’ (V07)

‘Important to perform to avoid claims’ (V10)

‘VLPM or we call KPI is a customer’s predefined service requirement or expectations of the vendors that vary according to the customer’s needs. It measures the performance of the vendors.’ (T22)

‘Management of vendors by well-defined scope and areas of measurement to minimise the impact to customers’ downstream supply chain activities. The VLPM measures PO/booking/cargo/documents, non-compliance vs. compliance to set up vendor penalty programs’ (T25)

‘A kind of criterion from customers which we must follow and approach their targets. It examines aspects of what we are and where we are.’ (T28)

‘It is basically the amount of cooperation between various parties, and particularly it measures whether one of the parties does more of the overall cooperation.’ (T30)

‘It is for continuous improvement. It identifies the root causes of performance issues, vendors’ issues. Process or system or self-company reviews of timeliness are important.’ (S14)
'Of course we can measure more about logistics in addition to the two matrixes we have. Like supply chain security, loss prevention, using quality trucking companies. How well they do with customs in their documentation is also very important. Vendor logistics capability depends on speed'. (S15)

4.4.4 Format Structure of VLPM

Participants were asked about the structure’s formality of their customers or organisations in developing the VLPM. Among all the participants, 90 percent confirmed their organisations have a formally structured VLPM. Ten per cent of participants replied they have a very formally structured VLPM setting. The detailed results for each of the individual groups and overall situation are displayed in Figure 4-6. It depicts the results by participants’ group. Figure 4-7 gives an overview of the findings. The following highlights are some of the participants’ inputs:

‘Some are formal and have measuring criteria’ (V02).

‘Yes but not all have a formal structure’ (V03).

‘Some informal assessments measuring only ETA, ETD and total transit time. Some are very detailed and measure cargo ready date, total order delivery lead time, dwell time at airport, document ready date, setting commit transit time and measure our on time delivery as detailed by hour, YTD, and percentage monthly’ (T21).

‘Some small customers use our LSP/KPI. Some larger customers have formal VLPM’ (T22).

‘75 percent of our business has formal VLPM’ (T23).

‘Most have informal VLPM. Thirty per cent formal and 70 percent informal (T29).

‘Some use formal measurement’ (T30).
4.4.5 Discussion of Findings for Research Question 1

The research findings discussed in Section 4.4.1 indicate that all the participants’ companies and some of their customers use VLPM to measure the vendor logistics performance. This shows that VLPM has predominantly been used to measure vendor
logistics performance in the apparel business environment. Participant V07 said that only 50 percent of their customers use VLPM; T21 answered not all of their customers used it; T30 replied that 90 percent of the customers used VLPM; S11 said they use VLPM but do not rely on the logistics performance to evaluate the factories; and S13 answered they use vendor scorecards to measure vendor logistics performance. It seems that that the use of VLPM for measuring vendor logistics performance is not so important and necessary as it appears not all companies used VLPM. However, the findings indicate against any suggestion that not all companies use VLPM.

As shown in Figure 4-5, the research finds that 90 percent of the participants consider VLPM is either important or very important to their organisation. All of the sourcing company participants believed VLPM is very important. Only 10 percent of the vendors and 3PL employees had a different view. The research results compare the recognition of VLPM’s importance to organisations with the practical implementation of VLPM. This demonstrates there is a gap that provides an improvement opportunity. This supports the research objective of proposing that VLPM be recognised and implemented in Asia’s apparel industry.

The participants were asked to share what VLPM means to them, and how formally it is structured in their organisation. The result discussed in Section 4.5.4 Figure 4-7 indicates that all participants have a formally structured VLPM. (Appendix VI provides a summary of participants’ views). By selecting, combining and summarising the key commonalities of the participants, it is possible to offer an answer to Research Question 1 (What is Vendor Logistics Performance Measurement?) and for apparel industry practitioners a VLPM can be described as an important measurement system that is formally structured with predefined requirements or expectations to evaluate vendors’ logistics performance, and to identify the root causes of performance issues to support the continuous improvement of an organisation’s operation processes and systems.

The findings discussed in Section 4.4.4 reveal that all the participants’ organisations have used formal structured VLPM to measure vendors’ logistics performance. The next
findings confirmed that up to 90 percent of the participants considered VLPM to be either important or very important to their organisations. These two findings demonstrate that VLPM has already been deployed as an important operations of organisations. Although the research result indicates that all participants have had the experience using VLPM, there are still many companies that do not implement VLPM.

A vendor may have different customers measuring their logistics performance. If a vendor can share their customers’ VLPM experience with those customers without VLPM implementation, it could help them to build a close and genuine partnership with them. It could help them to sustain their reliability and trustworthiness, even though they could be the one being measured.

Third party logistics firms provide logistics operations service support either to the sourcing company or the vendor, depending on the customers’ buying or selling terms. A 3PL would have different customers that implement VLPM. Like the vendors, they could share with those customers who do not have a VLPM the results of the VLPM.

4.5 Data Analysis for Research Question 2

Research Question 2 concerned what participants considered to be the most important criteria for VLPM. One of the major considerations in developing an effective performance measurement process is to identify what needs to be measured. The proper defining of measuring criteria is crucial for making an effective and valuable contribution to an organisation. During the interviews, participants were asked to share the criteria used to measure in their VLPM. Sections 4.5.1 to 4.5.4 provide the data from the research. Section 4.5.5 gives an analysis of the research findings.

4.5.1 Criteria Used in VLPM

In Table 4-2, 45 criteria are identified from the research after analysis of the input of the participants. Forty-five criteria were found to be either used individually or combined with the other criteria that organisations used to measure vendor logistics performance.
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### 4.5.2 Number of VLPM Criteria Used

The findings indicate that the number of the 45 criteria used an individual organisation ranged from one to nine. The median number of criteria used by an organisation was four as shown in Figure 4-8. This indicates that these organisations only used 9 percent of the 45 identified criteria.
4.5.3 Distribution of VLPM Criteria Used

Section 4.5.2 Figure 4-8 shows that most companies used four criteria for measuring VLPM. ‘On Time Delivery’ was selected by all the organisations. On Time Delivery, On-Time Booking, On-Time Documentation and Packaging are the top four criteria used for VLPM.

Figure 4-9 shows the 14 criteria used by the participants that are used by 10 percent or more of organisations. (See Appendix V for detailed percentages for all the 45 criteria used by companies.)
4.6.4 Popularity of VLPM Criteria

The findings regarding the popularity of VLPM criteria discussed in Section 4.6.3 above may aligned with the highest priority that a company wants to use to measure vendor logistics performance. Participants were asked to rank the criteria used in VLPM. The results of the analysis show that On Time Delivery; Quality of Shipment; Documents and On-Time Booking are the top four criteria. Next to On Time Delivery, Quality of Shipment is the second priority followed by On-Time Booking. Packing was the fifth-most popular criterion. It appears that the most frequently used criteria currently used by organisations are not totally aligned with the priorities of the companies. Figure 4-10 provides a clear view of the participants’ numbers of vote for the top three criteria used for VLPM. (See Appendix VI for the numbers of votes for all the other criteria).
4.5.5 Discussion of Findings for Research Question 2

The answer to the Research Question 2, ‘Which are the most important criteria for VLPM’ is as follows: On-Time Delivery is the most selected criterion that together with On-Time Booking; On-Time Documentations and Packaging are the top four most selected criteria used for VLPM. But in terms of priority, On Time Delivery; Quality of Shipment; Documents and On-Time Booking are found to be the top four.

The results show that the current measurement criteria used for VLPM by companies in the apparel industry are quite diverse. It is interesting that companies are measuring vendor logistics performance using different criteria within the same industry. Every company when developing a performance measuring system would identify what they need to measure. One reason that companies measure vendor logistics performance differently could possibly be they are not aware of what criteria the other competitors or market players in the same industry use. This could be because there is insufficient communication between partners when companies develop the VLPM. Thus, a
standardised VLPM to measure vendor logistics performance in the apparel industry is suggested.

In Section 4.5.1, the 45 criteria used for VLPM were presented. Firms used an average of four criteria, and 29 criteria were found to be used by companies individually for VLPM. This reflects the situation of companies when developing their VLPM. They may not be aware of how other companies measure vendor logistics performance. The apparel companies studied were measuring the vendor logistics operations differently without a proper standard.

Studies have been published on the development of logistics performance measurement models, but the measuring criteria defined in the studies are mostly from the perspective of buyers (Lau et al., 2002; Rafele, 2004; Ordoobadi, 2009b). Caplice and Sheffi (1994) propose eight criteria to evaluate performance efficiency and effectiveness. The eight criteria were: validity, robustness, usefulness, integration, economy, compatibility, level of detail, and behavioural soundness. Teng and Jaramillo (2005) propose a supplier performance evaluation matrix with five predefined clusters: delivery; flexibility; cost; quality and reliability to evaluate and select suppliers in the global textile and apparel industry.

This research identifies the following four criteria as the most common criteria used by companies on VLPM:

- on-time delivery
- on-time booking
- on-time documentations
- packaging

The four criteria listed below are identified as reflecting the highest priorities of companies:

- on-time delivery
• quality of shipment
• documents
• on-time booking

The criteria listed above were identified after analysis of the input from the three groups of participants, all of whom are professional and management experts in Asia’s apparel industry. These are believed to be specific and practical criteria for the measurement of vendor logistics operations performance. This research suggests that they be developed as the standard criteria used for VLPM in Asia’s apparel industry.

4.6 Data Analysis for Research Question 3

Research Question 3 sought to discover the main influences upon what an organisation might require for VLPM. Effective VLPM development and implementation is an interactive activity between sourcing company, vendor and 3PL, which relies on the engagement of supply chain partners and the resources being put in place. A causal relationship exists between these partners which begin from buying and selling, and a need to measure and to be measured. In between the sourcing company and vendor, the 3PL company plays an important role by providing the logistics service required. Therefore, the causal relationships of the partners may influence the effectiveness of a company’s VLPM development and implementation. In addition, the resources that partners put into the development and execution of VLPM are a significant influence as well. The resources can be management executives involved in the development stage, the performance review and the development of improvement strategies. It can also be developing a computer system to manage the VLPM information. The following sections will discuss the research findings on the influences which determine what VLPM an organisation requires. Sections 4.6.1 to 4.6.6 provide the data and Section 4.6.7 gives an analysis of the research findings.
4.6.1 VLPM Development Involvement

The objective of developing a VLPM system is for the sourcing company to measure the logistics performances of vendors. During the interviews, the sourcing company participants were asked what functions in their organisation participates in in the development of VLPM. The vendor is the one who is measuring and the 3PL organisation provides services support. This means that the sourcing company is the customer, and the participants were asked whether they were involved in the customer’s VLPM development.

The findings show that 80 percent of the vendors just followed the customer’s VLPM with no participation in the customer’s VLPM development. Only 10 percent of the vendors gave advice to the customer. However, 30 percent of the 3PL firms participated in the customer’s VLPM development. Even though 60 percent of the 3PL firms were not involved, they provided advice.

For the sourcing company, the participants input indicate that group functions are involved in the development of VLPM. They included: finance, logistics, IT (information technology), business, production and sourcing. The following are some the highlights captured from the participants’ input:

‘Logistics, finance and merchants are involved. However, we do not bring along the vendor and FF to develop the VLPM. We just design what we need.’ (Participant S19)

‘PD & D (Product Design & Development), sourcing and transportation team are involved.’ (Participant S20)

Figure 4-11 presents the research results of organisations involved in VLPM development by the three groups of participants. Figure 4-12 gives an overall view of the research findings.
4.6.2 Level of Management Involved in VLPM Development

Although the findings in Section 4.6.1 show a comparatively low percentage of vendors and 3PL firms participating in the customers’ VLPM development, the level of management involved was found to be senior. The findings show that 90 percent of the
management from all three groups of participants involved in the VLPM development were from function head to senior executive level. Figure 4-13 provides the level of management involved in VLPM development by group. Figure 4-14 gives an overall view of the research findings.

**Figure 4-13 Level of Management Involved in VLPM Development**

![Bar Chart](image)

**Figure 4-14 Overall view of Levels of Management Involved in VLPM development**

![Pie Chart](image)
4.6.3 VLPM Measuring Frequency

An organisation’s management resources such as executives’ time and investment in equipment and tools influence significantly influence the development and effectiveness of the measurement’s performance. Besides management’s participation, the measurement frequency, data management, and frequency of performance review also influence the measurement’s success. During the interviews, the participants were asked about the measuring frequency of the customers’ or internal VLPM.

Overall, 63 percent of the participants’ companies measured VLPM on a monthly basis whereas 20 percent measured quarterly. Figure 4-15 provides the detailed input by participants’ groups. Figure 4-16 gives an overall view of the research findings.

Figure 4-15 VLPM Measuring Frequency
4.6.4 Use of Computer System for VLPM

In today’s business environment, the use of computer system to manage information is considered as a basic requirement for an organisation. The capability, efficiency and system intelligence can vary according to the organisation’s needs. During the interviews, the participants were asked about what computer systems their company used to manage the VLPM.

The research found that 67 percent of the companies used the internal computer system to manage VLPM and 17 percent used either their internal system or the 3PL system. For sourcing companies, the results indicate 80 percent use their internal computer system to manage the VLPM. Sixty per cent of both vendor and 3PL use their internal system to manage the VLPM. Figure 4-17 provides details of the findings by participant group. Figure 4-18 gives an overall view of the research findings.
Figure 4-17 Use of Computer System to Manage VLPM

![Bar chart showing the use of computer systems for VLPM]

<table>
<thead>
<tr>
<th>Use of Computer System</th>
<th>Vendor</th>
<th>3PL</th>
<th>Sourcing Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal System</td>
<td>60</td>
<td>60</td>
<td>80</td>
</tr>
<tr>
<td>Internal or 3PL System</td>
<td>20</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>3PL System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No idea</td>
<td>20</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>

Figure 4-18 Overall View of Computer System Used for VLPM

![Pie chart showing the overall view of computer systems used for VLPM]

- Internal: 67%
- 3PL: 10%
- Internal or 3PL: 17%
- No idea: 6%
4.6.5 Frequency of VLPM Performance Review

The participation of management in VLPM development, the frequency of performance measurement, and computer system used to manage the information are factors with a significant influence on the development and execution of a measurement system. However, performance measurement without performance review is meaningless. During the interviews, participants were asked about the organisations’ frequency of VLPM review.

The results indicate that sourcing companies and 3PL firms reviewed VLPM performance more frequently than vendors. Half of the sourcing companies reviewed VLPM monthly and 40 percent reviewed quarterly. Half of the 3PL firms reviewed VLPM monthly and 20 percent quarterly. Overall, 40 percent reviewed monthly, 26 percent quarterly, 17 percent yearly and 17 percent only as required. This shows 60 percent of the companies reviewed VLPM in different frequency instead of monthly. Figure 4-19 provides details of the findings by individual groups. Figure 4-20 gives an overall view of the research findings.

Figure 4-19 VLPM Performance Review Frequency

![Figure 4-19 VLPM Performance Review Frequency](image-url)
4.6.6 Level of Management Reviewing VLPM

The attention to an activity by senior management in an organisation could obviously influence the activity’s priority, importance and effectiveness. During the interviews, participants were asked what level of management led the VLPM performance review. This could be one of the major factors influencing an organisation’s VLPM development.

The results show there 60 percent to 70 percent of all participants’ VLPM reviews were led by senior management. Ten per cent to 40 percent were led by function heads. Overall, 64 percent of the VLPM reviews were led by senior management and 27 percent by function heads. This shows most of the companies took VLPM performance seriously by assigning senior levels to lead the performance review. Figure 4-21 provides details of the findings by individual groups. Figure 4-22 gives an overall view of research findings.
Figure 4-21 Level of Management Leading VLPM Performance Review

Figure 4-22 Overall View on Level of Management Leading VLPM Review
4.6.7 Discussion of the Findings for Research Question 3

The implementation of supply chain management aims to enhance the relationship among companies from only the price negotiation between buyer-supplier to establish a close and true partnership in the supply chain (Teng & Jaramillo, 2005). Teng and Jaramillo (2005, p. 506) argue that ‘it is important for textile/apparel companies to find reliable and trustworthy suppliers, either domestic or international suppliers’. The results of this study indicate that this is not the case.

As discussed in Section 4.6.1, findings indicate that 80 percent of the vendors just follow the customer’s VLPM. They are not involved in the VLPM development. Also, 60 percent of the 3PL are not involved, but just follow the VLPM instructions of their customers. One of the vendor participants V03 said ‘No. They have their own policy and they do not want others to interfere with the decision.’ This indicates that the development of VLPM is still customer-driven. Most customers set up their VLPM without getting vendor and 3PL consent. Vendor and 3PL just have to accept what the customer requires. The lack of communication and partnership between supply chain partners in the current apparel business environment is not unusual.

With regarding to management participation in VLPM development, performance measurement and performance reviews, the research finds that 90 percent of the management from all three groups of participants involve in the VLPM development. They are from function head to senior executive level that participate in performance review, 64 percent of the VLPM performance reviews are led by senior management and 27 percent by function heads. These findings show that companies are looking at VLPM very seriously and it is important to the organisations. They let the senior executive to spend time on the development, management and regularly review of the vendor logistics performance.

According to the input of the sourcing company participants S19 and S20, the development of the company’s VLPM does not only involve logistics. Other functions such as finance, merchants, product development and other function teams are also
involved. This indicates that companies looking at VLPM do not merely consider the logistics functions in the company. It is a matter of multi-functional groups.

The research found 67 percent of the companies use their internal computer systems to manage VLPM and 17 percent use either internal or 3PL systems. For sourcing companies, the result indicates 80 percent use their internal computer systems to manage the VLPM. 60 percent of both vendor and 3PL firms use internal systems to manage the VLPM. This reflects companies not only invest the valuable time of senior management in VLPM activities but they also invest capital on the development of computer systems to manage the VLPM.

To summarise the research findings to answer Research Question 3, ‘What influences the VLPM that an organisation requires?’, the research confirms that:

1) An effective VLPM needs senior management:
   a. involved in VLPM development
   b. leading the performance measurement
   c. leading the performance review
2) There is a need for improvements in communication and mutual trust between partners in the supply chain management.
3) Regular VLPM measurement and reviews are needed.
4) A computer system needs to be developed to manage VLPM information.

The research findings in Section 4.6.1 indicate that, overall, more than half (53%) of the participants’ organisations were not involved in the development of customers’ VLPM. The findings indicate that 90 percent of vendors and 70 percent of 3PL were just following the customers’ VLPM. However, the research finds that 90 percent of the management from all three groups of participants were involved in VLPM development, from function heads to senior executive-level managers. Overall, 63 percent of the participants’ companies measured VLPM on a monthly basis.
The research also discovered that 67 percent of the companies used their internal computer systems to manage VLPM. In today’s business environment, IT systems must exist to support the organisation’s operations activities. Cocca and Alberti (2010) provide a summary of the most important elements of best practice performance measurement design, in which one of the key elements is to have IT infrastructure support.

The findings in this research confirm that companies are looking at VLPM very seriously and it is important to organisations. However, the research indicates that in a practical business environment, the development of VLPM is still customer-driven. There is a lack of communication and trust between supply chain partners in the current apparel business environment. According to Chan et al. (2003), effective performance measures should cover the areas of critical concern affecting common goals and strategies. VLPM is a common concern for all supply chain partners, both internal and external.

Based on input from sourcing company participants, it can be seen that the development of the company’s VLPM involves not only logistics but finance, merchants and product development, and other functions in which teams are also involved. This indicates that companies consider VLPM to be no longer just the concern of logistics functions in the company. It is a matter for multi-functional groups.

The implementation of supply chain management needs to establish close and true partnerships among companies in the supply chain. Therefore, trading partners need to agree on definitions linking activities and processes and their measurement of performance (Keebler & Plank, 2009). The findings in Section 4.7.5 illustrate that, overall, 40 percent of the participants’ organisations review VLPM monthly, 26 percent review VLPM quarterly and the rest review either yearly or only as required. VLPM reviews are less frequent than VLPM measures. According to Barber et al. (2006), there are number of issues related to improvement of management, such as collected data being ignored, and improvement techniques which are no longer being used because there are no drivers to ensure usage. The development of performance measurement provides analytical frameworks and models to aid management in planning and decision making.
both operationally and strategically (Stainer, 1997). These comments underline the importance of reviewing performance measurement.

Bond (1999) mentions that the objective of developing performance measures is to provide a mechanism for policy development relating to VLPM by senior management for improving product or service processes. The following are suggested for the development of VLPM:

1) Senior management involvement in:
   a. leading VLPM development
   b. leading the performance measurement
   c. leading the performance review

2) Collaboration requiring improvements in communication and mutual trust enhancement between partners in the supply chain

3) Regular VLPM measurement and review

4) Development of a computer system to manage VLPM information

4.7 Data Analysis for Research Question 3.1

This sub-question aimed to explore the question of how important it is to have specific criteria in VLPM. The research findings discussed in Section 4.6 show that On-Time Delivery, On-Time Booking, On-Time Documentation and Packaging are the four most-selected criteria. In addition, 29 out of 45 criteria were used individually in VLPM. During VLPM development, there could be specific criteria that companies identify to measure vendor logistics performance. Thus, participants were asked to indicate what they thought about the importance of having specific criteria used in VLPM. The following sections will provide the findings.
4.7.1 Importance of Specific Criteria for VLPM

The research results show that 50 percent to 70 percent of participants held that it is very important and 30 percent to 50 percent considered it was ‘important to have specific criteria set up for VLPM’. Overall, 60 percent of the participants believed it was very important, and 40 percent believed it was important to use specific criteria for VLPM. Participant S15 explained that it is ‘Very important in commit to customer on time delivery and deliver products fast with reasonable cost’ (Participant S15). S16 added the comment that ‘it is very important to us as an organisation. Because we depend on the performance of the vendors we can decide whether we will continue working with the vendor on an ongoing basis, and also our decisions about order placement for them from different merchandise categories.’ (Participant S16). Figure 4-23 displays details of the research findings by participants’ groups. Figure 4-24 gives an overall view of the research findings.

Figure 4-23 Importance of Specific Criteria in VLPM

![Bar chart showing importance of specific criteria in VLPM]

<table>
<thead>
<tr>
<th></th>
<th>Important</th>
<th>Very Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>3PL</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Sourcing Company</td>
<td>30</td>
<td>70</td>
</tr>
</tbody>
</table>
4.7.2 Change of VLPM Criteria

The importance of using specific criteria for VLPM was discussed above in Section 4.8.2. Participants were asked to share how often the criteria measured are changed in VLPM. The consistency of criteria in performance measurement is important for customers to understand the trend of the performance. It affects directly the focus of vendors’ attention on what they need to perform in order to meet the customers’ expectations.

The research found that overall 93 percent of the companies did not change their VLPM measurement criteria. This reflects the measurement of VLPM is very consistent. Figure 4-25 shows the situation of changes to VLPM by participants’ groups. Figure 4-26 gives an overall view of the research findings.
Figure 4-25 Change of VLPM Criteria

<table>
<thead>
<tr>
<th>Change of VLPM Criteria</th>
<th>Vendor</th>
<th>3PL</th>
<th>Sourcing Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Change</td>
<td>100</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Percent No Change</td>
<td>120</td>
<td>80</td>
<td>80</td>
</tr>
</tbody>
</table>

Figure 4-26 Overall View of Change of VLPM criteria

Overall View of Change of VLPM Criteria

- **Change** (7%)
- **No Change** (93%)
4.7.3 Discussion of Findings for Research Question 3.1

The findings discussed in Section 4.8.1 confirm that companies consider it important to identify specific criteria for VLPM. In Section 4.8.2, the results show that 93 percent of the companies do not change the VLPM criteria. This reflects the measurement of companies on vendor logistics performance is consistent. With that said, the 45 criteria use for VLPM identify and discuss in Section 4.6 should all be important to the companies. The criteria are rarely changed. Section 4.6.2 finds that companies use only from 1 to 9 criteria, and on average, 4 criteria are used for VLPM. It appears that companies may have the following situations in the measurement of their vendor logistics performance:

- The criteria they use for the VLPM do not cover all the important criteria.
- Besides the criteria they use for VLPM, they do not know what criteria the other competitors or industrial players use to measure VLPM, which may be important for them as well.
- They may be using inappropriate or unimportant criteria for VLPM

Furthermore, if the 45 identified criteria are all truly important for apparel companies for VLPM, this would mean that all the participants’ companies do not cover all the important criteria that they need. The research found that most companies do not change the criteria for VLPM. It is possible that some of the companies’ VLPM is measuring something not important or the VLPM itself is not effective. This is serious, as the research shows that companies regard VLPM as important. They spend lots of resources on VLPM development and implementation. Therefore, to answer Research Question 3-1 according to the research findings, it is important to have specific criteria in VLPM. The research results discussed in Section 4.8.1 confirm the importance of identifying specific criteria in VLPM. Section 4.8.2 reports that 93 percent of the participants’ organisations have not changed the VLPM criteria. This demonstrates that the setting of specific criteria for VLPM is consistently tied up with the logistics activities organisations set up as the targets they want to achieve. Bond (1999) mentions that
organisations need to learn to conduct strategic evaluations to adapt to changed circumstances. This induces a re-appraisal of the performance metrics used to monitor achievement. An effectively implemented VLPM aligns all the supply chain parties, including the sourcing company, vendor, and 3PL, to understand and communicate on vendor logistics operations. VLPM also helps organisations to evaluate and define the ranking of vendors, so that they can offer the outstanding vendors more business opportunities in recognition.

Performance measurement often focuses narrowly on easily quantifiable criteria. The use of criteria such as cost and productivity at the expense of other criteria is important to competitive success (Beatham et al., 2004). Below are some of the major reasons why it is important to select specific criteria used in VLPM, formulated after reviewing the participants’ views on VLPM (see Appendix IV):

- There can be additional measurements on top of other supply chain activities such as security, loss prevention, and use of transportation equipment.
- It is critical to have cost comparisons that benchmark customers.
- Appropriate selection of criteria helps inventory level control through clarity in the supply chain.
- Appropriate selection of criteria helps the examination of special service requirements to vendors according to the customers’ need.
- Appropriate selection of criteria helps organisations’ continuous improvement by identifying the root causes of performance issues.

The objective of using KPIs is to improve continuously the business activities that lead to the setting of higher performance targets (Haponava & Al-Jibouri, 2009). Since the indicators are based on the comparison of actual performance with targets or desired processes, it is crucial to identify the appropriate or specific measuring criteria to measure and reflect the actual performance of the organisation. According to the findings in Section 4.6.2, 45 criteria are identified from the research but an overall average of four
criteria should be used for VLPM by companies. This shows that the situation of companies may be:

- The criteria they use for the VLPM do not cover all the important aspects of the industry.
- They lack knowledge about what competitors or industrial practitioners measure in the VLPM that is important for them as well.
- There is a need to identify unimportant or wrong criteria for VLPM.

The vendor selection and evaluation process has multiple objectives; that is, typically more than one criterion (e.g. price, quality, delivery performance) needs to be considered (Weber, 1996). The research found that specific criteria are confirmed as important and consistently used for VLPM without frequent changes. Therefore, the development of a standardised set of VLPM criteria for the apparel industry is suggested.

**4.8 Data Analysis for Research Question 3.2**

This sub-question addresses the matter of how VLPM is shared and reviewed. Again, the implementation of supply chain management aims to establish a close and true partnership among companies in the supply chain (Teng & Jaramillo, 2005). The sharing of measurement performance is crucial for all partners to know how the operations are performed. Through the sharing and reviewing of the performance measure, areas needing enhancement and improvement can be identified. During the interviews, participants were asked how the VLPM of their companies was shared and reviewed with partners.

**4.9.1 Sharing of VLPM**

The research found that overall 67 percent of the participants’ organisations shared the VLPM with their partners. Ten per cent only shared the VLPM only by request and 23 percent did not share. Looking into individual groups of participants, 70 percent sourcing
companies did not share VLPM with 3PL. Ten per cent did not even share with vendors. For vendors, 40 per cent of the vendors’ customers shared the VLPM with them and 30 per cent did not share with 3PL. Thirty per cent of customers shared with them only as required. By way of contrast, 70 per cent of the 3PL do not receive the VLPM from customer. Only 20 per cent of the 3PL’s customers shared the VLPM with them. Figure 4-27 shows the findings on sharing of VLPM by participants’ groups. Figure 4-28 gives an overall view of the research findings.

**Figure 4-27 Sharing of VLPM**

![Diagram showing sharing of VLPM by participants' groups]

<table>
<thead>
<tr>
<th></th>
<th>Vendor</th>
<th>3PL</th>
<th>Sourcing Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>40</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Yes but not with Vendor</td>
<td>30</td>
<td>10</td>
<td>70</td>
</tr>
<tr>
<td>Only as required</td>
<td>30</td>
<td>70</td>
<td>10</td>
</tr>
</tbody>
</table>

**Figure 4-28 Overall View of Sharing of VLPM**

![Pie chart showing overall view of sharing of VLPM]

- Yes: 67%
- No: 23%
- Only as required: 10%
4.8.2 Involvement of Organisations in VLPM Review

Performance measurement needs to be reviewed for all concerned parties to know about the performance of the operations process. Through reviewing the performance measure, the involved parties can identify where and what enhancements and improvements need to be made. Therefore, performance review is an important process for achieving the objective of developing performance measurement. During the interviews, the participants were asked to share the involvement situation of partners in the VLPM review.

An overall view of the findings indicates that 67 percent of the participants’ companies were involved in VLPM reviews. Twenty per cent were involved only as required and 13 percent of the participants’ companies were not involved in VLPM reviews. Ninety percent of the sourcing companies were involved in VLPM reviews, 10 percent only as required. Seventy per cent of vendors were involved and 30 percent were involved only as required. For 3PL, 40 percent were involved in VLPM reviews with their customers and 20 percent were involved only as required and 40 percent were not involve in VLPM reviews. Figure 4-29 displays the participants’ organisations involved in VLPM by group. Figure 4-30 gives an overall view of the research findings.
Figure 4-29 Organisations involved in VLPM Reviews

![Organisations Involved in VLPM Review](image1)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>Only as require</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor</td>
<td>70</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>3PL</td>
<td>40</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Sourcing Company</td>
<td>90</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4-30 Overall View of Organisations Involved in VLPM Reviews

![Overall View of Organisations Involved in VLPM Review](image2)

- Yes: 67%
- Only as required: 20%
- No: 13%
4.8.3 Discussion of Findings for Research Question 3.2

The research findings in Section 4.9.1 show that 67 percent of the participants’ companies share the VLPM. 10 percent only share as required and 23 percent do not share. In the situation of the vendor group, only 40 percent of the vendor customers share with them the VLPM results. For 3PL, 70 percent of the customers do not share with them the VLPM. The sharing of VLPM means to let all partners understand the performance of vendor logistics operations. If vendors perform well in logistic operations, the customer may think it is not necessary to share the report. However, the sharing of performance measurement can help to enhance the visibility and assure all concerned that there are no mistakes occurring during the measurement process. Furthermore, it helps the partners to understand how well the vendors performed if it is the case. Obviously, the results reflect that there are significant improvement opportunities for enhancing VLPM performance visibility.

With regard to VLPM reviews, the findings indicate that only 67 percent of the participants’ companies involve in VLPM reviews. 20 percent involve only as required and there 13 percent of the participants’ companies do not involve in VLPM reviews. It is not surprising that 90 percent of the sourcing companies involve in VLPM reviews as they should be the ones to drive the measurement. However, there are only 70 percent of the vendors and 40 percent of the 3PL involve in VLPM reviews. The previous sections confirm that VLPM is considered important, and that means companies are concerned about the logistics performance of vendors. However, it is found that companies do not review performance together in order to understand the vendors’ logistics operation performs, and review the areas that needs to be improved or enhanced. It is not unusual for companies to keep some measurement reports confidential. Their reasons for doing so could be financial, strategic and security related. Vendor logistics performance supposes not covering any confidential information that cannot be shared with the related vendors and 3PL firms.
Based on the research findings, the answer to Research Question 3-2 (How is VLPM shared and reviewed?) is that current practices are illogical and in conflict with the findings of companies looking at VLPM as an important measurement. The lack of sharing and reviewing of VLPM performance can hinder the development of VLPM to enhance and improve the vendors’ logistics performance. This affects the objective of VLPM, which is to enhance and improve the vendors’ logistics performance. In addition, if they review previous change initiatives in a measurement system, mistakes made in the past are not made again, especially with respect to the use of measures that do not properly reflect ongoing logistics performance (Barbosa and Musetti, 2011).

In their study about improving supply chain performance through improved visibility, Bartlett et al. (2007) argue that there is some nervousness regarding the sharing of information. This nervousness was overcome by agreeing that each party had the right to withhold information either due to commercial sensitivity or competitive advantage. The exchange of high-quality information as part of an improvement initiative does lead to significant improvements in the overall performance of the supply chain.

These findings reveal that VLPM usually involves the sourcing company, while the vendor, and 3PL firms are not so much involved. 3PL providers are seen as strategic partners that have a critical role in the customer’s supply chain strategies (Selviaridis & Spring, 2007). In fact, a 3PL provider can be a strategic partner of various customers from either the same or different industries. They provide services in the front line and services requests can come from both the vendors and the sourcing company. 3PL possess comprehensive logistics knowledge, experience and practical problem solving capabilities in all aspects of logistics. They should be able to contribute significant value to both the vendor and the sourcing company once they are connected. The improvement of the sharing of VLPM will enable all partners to understand the performance of vendor logistics operations.
4.9 Data Analysis for Research Question 4

Research Question 4 aimed to explore the importance of VLPM for the continuous improvement of an organization, and the areas in which VLPM influences the organization. One of the reasons that organisations engage in performance measurement is because it helps organisation to identify specific issues and encourage people to find ways to change and improve performance (Beatham et al., 2004). Lambert and Burduroglu (2000) argue that a performance measurement system can provide feedback for timely response, as well as monitoring and enhancement purposes. VLPM monitors vendor logistics performance and provides feedback in a timely manner to the customer. It is important to identify the areas in which VLPM supports the enhancement, or continuous improvement of the companies and partners. This is one of the objectives for this research. The participants were asked during the interviews to share their views of the importance of VLTM and to identify the areas in which the VLPM influences the organisations’ continuous improvements. The following sections will discuss the findings of the research.

4.9.1 Importance of VLPM for Continuous Improvement

The research finds that 40 percent of the participants hold that VLPM is important and 60 percent consider that it is very important to an organisation’s continuous improvement. 70 percent of the sourcing company participants believe that VLPM is very important but only 30 percent of the vendors feel the same. An interesting finding is that 80 percent of the 3PL consider that VLPM very important. Figure 4-31 provides the participants’ views by group on the importance of VLPM. Figure 4-32 gives an overall view of the research findings.
Figure 4-31 Importance of VLPM to Organisations’ Continuous Improvement

![Importance of VLPM to Organisation's Continuous Improvement](image1)

<table>
<thead>
<tr>
<th></th>
<th>Important</th>
<th>Very Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>3PL</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Sourcing Company</td>
<td>30</td>
<td>70</td>
</tr>
</tbody>
</table>

Figure 4-32 Overall View of the Importance of VLPM to Organisations’ Continuous Improvement

![Overall View of the important of VLPM to Organisation's Continuous Improvement](image2)
4.9.2 Areas of Continuous Improvement Influenced by VLPM

The importance of VLPM’s influence on organisations is confirmed by the findings in Section 4.10.1 above. Participants were asked to share in what areas they thought VLPM benefited their external partners such as customers, vendors or 3PL and in what areas they thought VLPM benefited their company internally. After the analysis of all the participants’ input, there are 14 benefit areas identified for where VLPM helps external partners of the participants’ organisations in terms of continuous improvement. Table 4-3 provides a list of the 14 identified areas.

Table 4-3 Perceived Continuous Improvement Benefits of VLPM for External Partners

<table>
<thead>
<tr>
<th>Benefit Areas to External Parties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bench Marking</td>
</tr>
<tr>
<td>Business Strategy</td>
</tr>
<tr>
<td>Communication</td>
</tr>
<tr>
<td>Competitive Advantage</td>
</tr>
<tr>
<td>Cost Management</td>
</tr>
<tr>
<td>Customer Services</td>
</tr>
<tr>
<td>Inventory Management</td>
</tr>
<tr>
<td>Management Efficiency</td>
</tr>
<tr>
<td>Operation</td>
</tr>
<tr>
<td>Relationship Building</td>
</tr>
<tr>
<td>Resource Management</td>
</tr>
<tr>
<td>Set Up Guidance</td>
</tr>
<tr>
<td>Sourcing Strategy</td>
</tr>
<tr>
<td>Visibility</td>
</tr>
</tbody>
</table>
There are three benefit areas including visibility (70%), benchmarking (53%) and relationship building (50%) in which over 50 percent of the participants believe VLPM is helpful to their external partners’ performance improvement. Figure 4-33 provides details of the 14 benefit areas and the percentages of participants who consider VLPM benefits their external partners in continuous improvement.

**Figure 4-33 Frequencies of Perceived Continuous Improvement Benefits of VLPM for External Partners**

The participants were asked what areas they believed VLPM benefited their company internally in regard to continuous improvement. Table 4-4 provides the list of the 16 identified areas.
Table 4-4 Perceived Internal Continuous Improvement Benefits of VLPM

<table>
<thead>
<tr>
<th>Benefit Areas Internal to Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bench Marking</td>
</tr>
<tr>
<td>Business Strategy</td>
</tr>
<tr>
<td>Communication</td>
</tr>
<tr>
<td>Competitive Advantage</td>
</tr>
<tr>
<td>Cost Management</td>
</tr>
<tr>
<td>Innovation</td>
</tr>
<tr>
<td>Inventory Management</td>
</tr>
<tr>
<td>Management Efficiency</td>
</tr>
<tr>
<td>Operation</td>
</tr>
<tr>
<td>Relationships</td>
</tr>
<tr>
<td>Resource Management</td>
</tr>
<tr>
<td>Set Up Standard</td>
</tr>
<tr>
<td>Sourcing Strategy</td>
</tr>
<tr>
<td>Strategic Partnership</td>
</tr>
<tr>
<td>Technical Services</td>
</tr>
<tr>
<td>Visibility</td>
</tr>
</tbody>
</table>

There are four benefit areas which over 30 percent of the participants believe are helpful to their organisations. They are: operations (50%), benchmarking (47%), visibility (33%), and relationship building (30%). Figure 4-34 provides a detailed list on each of the 16 benefit areas and the percentage of participants who consider VLPM benefit their organisation’s continuous improvement.
Based on the research findings from the participants’ views on VLPM benefits for their organisations and external partners in continuous improvement, a combined list of 17 benefit areas is identified. There are four areas which over 40 percent of the participants believed were helpful to organisations’ continuous improvement. They were visibility, benchmarking, operations and relationship. Figure 4-35 provides a detailed list on each of the 17 benefit areas with the percentages of participants that believe VLPM is helpful to an organisation’s continuous improvement.
4.9.3 Discussion of Findings for Research Question 4

Research Question 4 explored the question of the importance of VLPM for continuous improvement of an organisation, and in what areas VLPM is important. The research findings discuss in Section 4.10.1 show that all participants believe VLPM does not merely monitor the performance of vendor logistics operations. VLPM is important because it supports partners’ continuous improvement. Section 4.10.2 presents 17 benefit areas that participants believe can help the continuous improvement of an organisation. Visibility, benchmarking, operation and relationship building are the areas in which the participants believe VLPM is most helpful to companies among the 17 areas.

Visibility
Visibility is identified as one of the important benefits that VLPM provides, because it helps to improve an organisation’s performance. This supports the research findings discussed in Section 4.9.3 regarding the current situation about the sharing and review of VLPM. Organisations develop measurement of vendor logistics performance, but the research finds that most of them do not share the performance report with their business partners. Vendors and 3PLs do not know how their logistics performance has been assessed unless they are informed by their customers. As discussed in previous sections, the purpose of a performance measurement system is to monitor, provide feedback and enable to enhance the performance of an operation. The performance of organisations cannot be improved if there is no visibility between partners of performance measurement to identify what areas need to be improved.

Benchmarking
Benchmarking is a management technique that helps organisations and individuals learn and develop to achieve business improvement (Fernandez et al., 2001). Zairi and Youssef (1995, p.65) recommend that organisations should ‘…more adequately meet end-user customer requirements; establish goals based on concerted view of the external conditions; determine true measures of productivity; attain a competitive position; and become aware of and search for industry best practice.’
Therefore, participants in the research believed VLPM helps to support the alignment of organisations’ continuous improvements with the objective of the development and implementation of VLPM.

**Relationship building**

Relationship building contributes to higher performance through the achievement of chain members implementing collaborative practices (Simatupang & Sridharan, 2004). This is again aligned with the research findings discussed in Section 4.7.7 about the development of VPLM that an organisation requires, and in Section 4.9.3, where sharing and reviewing the results of VLPM were discussed. The research finds that the practice in sourcing companies does not involve vendors and 3PL in VLPM development. Also, they do not share VLPM results with vendors and 3PL firms. With improvements to the collaborative relationship between the partners on VLPM development and implementation, VLPM could enhance organisational performance.

**Operations**

The objective of VLPM development and implementation is to monitor vendor logistics performance and provide information of enhancement opportunities. The continuous improvement of operations is one of the areas in which VLPM can contribute to organisations. Continuous improvement should be a way of corporate life in today’s business environment. New products and services development must be on target at any time. Business process redesign with greater flexibility and innovation is crucial (Zhang & Cao, 2002).

As discussed in Section 2.3.3, the measurement of KPIs and benchmarking thinking mirror some of the concepts underlying Total Quality Management (TQM) in that management attempts to develop a continuous improvement mechanism to monitor performance and to achieve zero defects in performing business processes (Broderick et al., 2010). VLPM aims to measure the vendors’ logistics performance and to identify existing problems. Gore Jr (1999) describes continuous improvement as one of the central requirements for efficient and effective process management. Quality practitioners
and theorists have always been concerned with the concept of continuous improvement. One of the fundamental concepts is to loop at every step of the process and create an environment that encourages constant evaluation of results and individual efforts to improve by the use of feedback. Continuous improvement has become an important strategy in improving organisational performance (Nilsson-Witell et al., 2005). Table 4-3 provides the research findings in 14 areas in which participants believe VLPM can help the companies’ external partners in continuous improvement. Visibility, benchmarking, and relationship building are the top three areas.

Pan et al. (2004, p. 823) mention that ‘Once the existing service problems are identified and improvement project are prioritised, it can lead to the direction of continuous improvement for any service industry’. In Table 4-4, 16 areas are identified that participants believe VLPM can help their own companies’ continuous improvement. A combined list of 17 areas is identified. Visibility, benchmarking, operations and relationship building are the top four areas where VLPM can help organisations’ continuous improvement.

One of the reasons organisations engage in performance measurement is because it helps organisations to identify specific issues and encourages people to find ways to change and improve performance (Beatham et al., 2004). Lambert and Burduroglu (2000) point out that a performance measurement system can provide feedback for timely response, as well as monitoring and enhancement purposes. VLPM monitors vendor logistics performance and provides feedback in a timely manner to the customer. This research demonstrates that VLPM is an important KPI recognised by practising managers and management executives that can influence, and is helpful for, the continuous improvement of organisations.

### 4.10 Unusable Data Collected from Interviews

Because the researcher used a digital voice recorder to record the summary input of participants’ views, the researcher was able to review frequently and closely the inputs from participants. During this process, some of the inputs from participants were found to
be unusable and these have not been included in the research. Following are some of the examples of unusable data:

Some responses to questions about participants’ view of VLPM (see Appendix IV) were:

- ‘Tight and need to perform 100 percent to meet target.’ (V01)
- ‘It is part of the operation procedure for measuring the process of commodity delivery.’ (V03)
- ‘Check our document and factory performance’. (V09)
- ‘It depends on the customer whether they prefer and how they set the KPI.’ (T23)

Interview Question 16, ‘How do your customers address the performance issues from the VLPM?’ was found to be irrelevant for the research topic (see Appendix IX and X). The researcher has not used the data relating to Question 16 in the research presented herein.

4.11 Unplanned Research Findings

The previous sections in this chapter discussed the findings for the research questions and included results relevant to the importance, criteria, influence and continuous improvement of VLPM. Some findings which were not anticipated, however, emerged from participants’ responses, as explained below.

4.11.1 Use of VLPM to Prevent Customer Penalties

According to participants V02 and V10, VLPM is an important measurement index to measure their performance according to the requirements of customers. The achievement of the preset performance requirements from the customers helps them to prevent penalties. This finding was not planned in the research and has not been discussed in the literature review in Chapter 2.
In practice, legal penalty clauses in service or buying contracts are not uncommon. The objective is to cover one’s costs in the event of contract party violations of contracting requirements. According to Stuart et al. (2012), a critical element for achieving the reported benefits from collaborative supplier relationships is the establishment of trust. Legal penalty clauses cover violations, while the trust level between partners is ‘semi-strong’. The higher the penalty, the greater the probability that partners will be trustworthy (Laeequddin & Sardana, 2010).

However, in light of building long-term relationships, it is suggested that companies should review penalty policies (Fram & Callahan, 2001). It is not the objective of this study to examine VLPM as a mechanism for preventing customer’s penalties on vendors. However, this adds to the knowledge of VLPM and the use of VLPM for this purpose can be further studied.

4.11.2 Numerous Criteria Used in VLPM

The next unplanned finding was that there is a large number of criteria used in VLPM. Chapter 2 discusses various systems for measuring the performance of organisations. The major measurement systems discuss include: Time to Market; Balanced Score Card, Key Performance Indicators; Total Quality Management, Just in Time, Customers Experience; Activity Base Costing and Cost Management. These measuring systems focus mainly on the measurement of organisations’ overall performance in terms of time, quality and cost. There are no specific criteria for vendor logistics performance discussed. With reference to Figure 4-2, there are 45 criteria identified by participants that are used in VLPM. Vaidya and Hudnurkar (2013) study multi-criteria supply chain performance evaluation, and identified 12 categories that cover more than 80 criteria for measuring the supply chain performance. However, they do not focus on VLPM. Other scholars have studied supply chain and logistics performance measurement in various spectrums (Caridi et al., 2013; Chow et al., 1994; Simatupang & Sridharan, 2004). But the literature relating to the study of identifying VLPM criteria is scarce. The findings of the 45 criteria in this research are essential and add knowledge to fill this gap.
4.12 Summary of Research Question Findings and Unplanned Findings

Figure 5-1 provides a summary of the conclusions for the research questions and the unplanned findings. The conclusions for the research questions enable the drawing of the conclusion that will be discussed in next section.

Table 4-5 Summary of Conclusions to the Research Questions and Unplanned Findings

<table>
<thead>
<tr>
<th>Research Question No.</th>
<th>Summary of Conclusion for the Research Questions and Unplanned Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>What is Vendor Logistics Performance Measurement?</strong>&lt;br&gt;After selecting, combining and summarising the key points of view of participants, the following description of VLPM is provided for the apparel industry:&lt;br&gt;‘VLPM is a formally structured measurement system with predefined requirements or expectations that is used to evaluate vendors’ logistics performance, and to identify the root causes of performance issues. VLPM can be used to help the continuous improvement of an organisation’s operations processes and systems**</td>
</tr>
<tr>
<td>2</td>
<td><strong>Which are the most important criteria for Vendor Logistics Performance Measurement?</strong>&lt;br&gt;There are 45 criteria identified to be used in VLPM (Table 4-2) 4 most common key criteria On-Time delivery, On-Time booking, On-Time documents, and Packaging found to most selected for the use of VLPM.</td>
</tr>
<tr>
<td>3</td>
<td><strong>What influences the types of VLPM that an organisation requires?</strong>&lt;br&gt;The research identified the four elements below which are the major influence on the VLPM development an organisation require (Section 5.4.2):&lt;br&gt;1) Senior management involve in VLPM:&lt;br&gt;   a. Development&lt;br&gt;   b. Leads the performance measurement&lt;br&gt;   c. Leads the performance review&lt;br&gt;2) Collaboration requires that include improvement on communication and mutual trust enhancement between partners in the supply chain management.&lt;br&gt;3) Regular VLPM measurement and review&lt;br&gt;4) A computer system develops to manage VLPM information</td>
</tr>
<tr>
<td>3.1</td>
<td><strong>How important is it to have specific criteria in the VLPM?</strong></td>
</tr>
</tbody>
</table>
It is important to identify specific measuring criteria for VLPM. A summary of the major reasons for the importance of selecting specific criteria set in VLPM is provided below (see Section 5.5). The reasons are:

- It can be an additional measurement on top of other supply chain activities, e.g. security, loss prevention, and use of transportation equipment.
- It can help prevent arguments when something happens in operations.
- It enables cost comparison that makes it possible to benchmark customers.
- It can define vendor management scope and areas with penalty systems that help to minimise vendor performance failure, or help vendors to avoid claims.
- It helps inventory level control through clarity in the supply chain.
- It makes it possible to predefine special service requirements to vendors according to the customers’ needs.
- It supports organisations’ continuous improvement by identifying root causes of performance issues.

3.2 How is Vendor Logistics Performance shared and reviewed?

A gap exists in the collaboration of trading partners in the sharing of VLPM. There is some nervousness regarding to sharing of information. The situation still appears in the business environment. VLPM is reviewed in most cases by the sourcing company and vendor. 3PL are not involved much. From a strategic partner perspective, the collaboration between trading partners to linking activities, processes and their measures of performance is imperative. (Section 5.6)

4 How important is VLPM for the continuous improvement of an organisation? In what areas does VLPM influence an organisation?

VLPM is an important KPI and is recognised by practising managers and management executives. It can influence and is helpful for the continuous improvement of organisation in a wide range of areas. A total number of 17 influence areas are identified. Among the 17 influence areas, the top four benefit areas in which participants believe VLPM can influence and help an organisation’s continuous improvement are: Operations; Benchmarking; Visibility and Relationship Building (Section 5.7).

The influence areas identified give good guidance for organisations in considering the values and contributions for VLPM development and implementation.

New Findings Use VLPM to prevent Customer’s Penalties

The research found that VLPM can be an important measurement index to measure an organisation’s logistics performance according to the requirements.
of customers. The achievement of the preset performance requirements of customers helps organisations to prevent penalties (Section 5.8). In practice, legal penalty clauses listed on service or buying contracts are not uncommon. The objective of such clauses is to cover one’s costs incurred when the other contract party fails to fulfill contracting requirements. In light of building long-term relationships, it is suggested that companies should review the penalty policies. It is not the objective of this study to test VLPM as an index for preventing customers’ penalties on vendors. But this adds to the body of knowledge of VLPM and can be further studied.

**Numerous Criteria Found to be used in VLPM**

There were 45 criteria identified from the research that were used in VLPM according to the input of the participants. The literature relating to the study of identifying VLPM criteria is scarce. The findings of the 45 criteria in this research are essential and add to the body of knowledge that helps to fill gaps in knowledge (Section 5.8).

Source: Developed for the research

### 4.13 Chapter Summary

This chapter began with a description of the cases studies use in this research. Background information on the participants and the nature of their serving organisations was provided. The data collected from the research interviews has been provided to addressing the research questions identified in Chapter 2. The data analysis on each of the research questions is provided through detailed content analysis, pattern-matching and repeated observation to show the patterns of the results. The next chapter will present the findings of this research. It will also discuss the contributions, limitations and implications of the research results.
Chapter 5 – Research Conclusions and Contributions

5.1 Introduction

This chapter discusses the comparison of the research findings on each research question with the recent publications and literature from Chapter 2. Through the discussion of similarities and difference between this study and the literature, the chapter provides the conclusions of the research problem. The chapter also discusses the limitations of the research, and its contributions to the body of knowledge. Finally, this chapter provides suggestions about the direction of future research. Figure 5-1 presents the structure outline for this chapter.

5.2 Response to the Research Problem and Objective

The research problem was: ‘Should organisations develop a VLPM tool, and if so, how should they do so’? The objective of this study was: ‘To understand the benefits and requirements of VLPM for organisations in the apparel industry in Asia.’ The research questions developed from the research problem and objective, and from consideration of the gap in the literature were answered, by analysis of the input from the research participants. Thus, the research problem was addressed, the research objective was fulfilled, and a deeper understanding of the benefits and requirements of VLPM was achieved.

Answers to the Research Questions are as follows:

Research Question 1: ‘What is Vendor Logistics Performance Measurement?’

Based the points of view of the participants, all of whom are professionals and experts in the apparel industry, VLPM could be described as:
Figure 5-1 Chapter Five Outline

5.1 Introduction

5.2 Responses to Research Problem and Objective

5.3 Implications for Methodology

5.4 Contribution to Theory

5.5 Contributions to Policy and Practice

5.6 Proposed VLPM Model for Apparel Industry Organisations

5.7 Limitations of the Research

5.8 Recommendations for Future Research

5.9 Chapter Summary
A formally structured measurement system with predefined requirements or expectations, used to evaluate vendors’ logistics performance, and to identify the root causes of performance issues. VLPM can be used to help the continuous improvement of an organisation’s operations processes and systems.

**Research Question 2:** ‘Which are the most important criteria for Vendor Logistics Performance Measurement?’

The research results shows the four criteria listed below are identified as reflecting the highest priorities of companies:

- on time delivery
- quality of shipment
- documents
- on time booking

**Research Question 3:** ‘What influences the type of VLPM that an organisation requires?’

The research results find that development of VLPM is influenced by the following:

1) Senior management involvement in:
   a. leading VLPM development
   b. leading the performance measurement
   c. leading the performance review

2) Collaboration to improve communication and mutual trust between partners in the supply chain.

3) Regular VLPM measurement and review.

4) A computer system for managing VLPM information.
**Research Question 4:** ‘How important is VLPM for the continuous improvement of an organisation? In what areas does VLPM influence an organisation?’

The research findings discussed in Section 4.10.1 show that all participants believe VLPM does not merely monitor the performance of vendor logistics operations. VLPM is important because it supports partners’ continuous improvement. Section 4.10.2 presents four areas where participants believe VLPM is most helpful to companies: visibility; benchmarking; operation; and relationship building.

In recent decades, broad discussions have focused on measuring and improving the performance of apparel suppliers from a total supply chain perspective (Au & Ho, 2002; Rollins et al., 2003; Lee & Kincade, 2003; Christopher et al., 2004; Hull, 2005; Manzini et al., 2005). The implement of VLPM for companies to monitor vendor logistics performance and contribute to the enhancement of vendor logistics performance are highly recommended.

According to the comments of the participants describe above, the goals set for this study were achieved. The comments support the supposition that the development of VLPM is essential for the continuous improvement of an organisation’s operations, processes and systems. Key aspects of the importance of VLPM development are expanded as follows:

**VLPM is needed for organisations**

Logistics management has developed rapidly as one of the essential business management strategies. An effective logistic performance measurement provides feedback for timely response as well as monitoring and enhancement for the logistics performance of an organisation. VLPM helps to establish the current vendor logistics performance status and monitor the operations progress over time against benchmarks. It can be a communication tool to bring strategic partners together to identify what is important to the business from a logistics perspective. The performance data provide insights of the performance issues. It allows organisations to rationalise and focus on
what the priorities should be so that organisation can encourage its employees to search
for ways to change and improve. The research results reflect the predominant use and
level of importance of VLPM.

**VLPM Development Process**

A key element in the success of VLPM development is the involvement of senior
management. An effective VLPM should cover the important criteria that are of critical
concern to the organisation’s goals and strategies. Senior management needs to define
and provide the direction of the organisation’s development goals and strategies. This is
important for the decisions and activities undertaken during the change process. The next
important element is collaboration. A VLPM is a common concern among all strategic
partners, both internal and external. Collaboration between partners’ senior management
in identifying the measuring criteria with mutual agreement and understanding is
imperative. Thus, an organisation developing VLPM should start by getting together the
related strategic partners in the process of identifying the important measurement criteria
and the standard requirements that he VLPM should cover. According to the research
results of VLPM development mentioned in Section 4.7.1, both vendors and 3PLs are
frequently not involved in the development stages of sourcing companies’ VLPMs. In
fact, both vendor and 3PL operate and handle different customers. In most situations, the
customers are in the same industry. Each customer may have its own measurement
criteria for VLPM. Therefore, the involvement of vendors and 3PLs in the development
stages of a sourcing company’s VLPM could add value to the process by obtaining
agreement on the criteria and standards used by customers. This helps the sourcing
company to benchmark with others, especially those in the same industry, with respect to
what important criteria they are measuring and the standard cover in the VLPM.

**Resources for VLPM Development**

A computer system is required to operate and manage VLPM. The computer system to
operate and manage VLPM can be self-developed or it can be a system developed by
strategic partners such as 3PLs. In today’s business environment, the use of IT is a must. It can reduce information flow times. A comprehensive logistics reporting system can accurately and effectively read the market’s situation that organisations can react according to the dynamic business environment requires. Competition in the business world has now extended to the time taken to capture one’s performance information and customer feedback. It is imperative for organisations to review, improve, enhance of develop business strategies so as to react speedily to market changes and customer requirements.

VLPM establishes the current vendor logistics performance status and monitors the operations progress over time and against benchmarks. VLPM is a communication tool to bring strategic partners together to identify what is important to the business from a logistics perspective. Therefore, a formal structure and measurement consistency in terms of criteria and measuring cadence is needed.

A measurement systems without information sharing and performance review is meaningless. It is the starting point of supply chain and logistics collaboration that aims to provide timely and relevant information to senior management and decision-makers to plan and control logistics operations. Therefore, information sharing is important for the effectiveness of different functions across interdependent organisations. Performance measurement review is the initial requirement to achieve consensus amongst the top managers as to what the strategic direction of the organisation is. Therefore, VLPMs are contemporary by their very nature, and need to be reviewed, maintained and updated.

**VLPM Benefits for Organisations**

VLPM supports organisations to establish their current vendor logistics performance status and monitor the operations progress over time. It helps to benchmark vendors’ performance. An effective VLPM is a good communication tool to bring strategic partners together to identify what is important to the business from a logistics perspective. According to the findings shown in Section 4.6.1 Figure 4-2, the criteria
used in VLPM reflect that VLPM assists an organisation to review a wide range of aspects of the current vendors’ logistics performance. It allows organisations to identify and prioritise the operational issues and search for ways to change and improve. In addition, with reference to Section 4.10.2 Figure 4-35, there are 17 areas in which VLPM supports the continuous improvement of an organisation. Among the 17 criteria, visibility; benchmarking; operations and relationship are the four major areas the research participants believe they help to improve organisation’s continuous performance improvement through effective VLPM.

In the four major areas and the other 13 benefit areas, VLPM helps an organisation and its strategic partners’ continuous improvement. The research found that a proper customer-defined VLPM can be a useful tool for vendors to prevent penalties or claims from customers. VLPM can enable a firm to know exactly what is needed to fulfill the customers’ requirements. Thus, VLPM can help firms to avoid confusion and misunderstanding that can lead to penalty claims by customers. From a 3PL perspective, based on the different customers’ VLPM, there is an opportunity for them to combine and develop their own VLPM. It could be a good service product for them to provide to those customers without one. A record of proven VLPM performance will reassure customers. It helps to convince potential customers of their effectiveness in providing services. This could enhance their competitive advantage in the marketplace. VLPM is a strategic measurement tool with significant benefits for all the strategic partners including the sourcing company, vendor and 3PL in apparel supply chain operations.

### 5.3 Implications for Research Methodology

The research demonstrated case study as an essential research approach for exploratory study such as this research into the use of VLPM in the Asian apparel industry. Its inherent adaptability allows for change as the research progressed. The research used in-depth interview discussions with the participants from the researcher’s previous personal network. Only two out of the 30 participants were wary and concerned about whether the words they said would be recorded. They preferred the researcher to take written notes
during the interview. The other 28 participants agreed to the use of a digital audio recorder during the interviews.

During the interviews, the researcher used a digital audio recorder for the interviews instead of taking hand writing notes with the acceptance of the participants prior to the interviews beginning. The use of recorder kept the interviews going smoothly. It avoided the distraction of the researcher writing down interview notes during the interviews. It meant that the researcher retained the original copy of the interview record that prevented the researcher from misunderstanding and taking erroneous notes. The participants appreciated the use of digital audio recording that preserved the originality of the discussions. The use of audio or video recorders for collecting data in interviews for case study methodology may be increased in future with respect to time and efficiency perspectives.

5.4 Contribution to Theory

The research deepens understanding of the benefits and requirements of VLPM for organisations in the apparel industry, which generated the research problem related to how and why VLPM needs to be developed. The research findings contribute to the body of knowledge in the parent disciplines of logistics management and logistics performance measurement and how VLPM contributes to continuous improvement. The implications are discussed in the following sections.

Research Gap in Logistics Management Literature

In Chapter 2, the literature review finds that logistics covers various activities in the physical distribution of materials and finished goods. Logistics management forms an important part of any company’s business strategy. The efficient performance of logistics management is imperative to support an organisation to achieve its business objectives. The research has provided an insight into a gap in logistics performance measurement that exists between vendors and 3PL as shown in Chapter 2, Section 2.6. The research explores and confirms the needs and benefits of developing VLPM that can fill the gap to
support organisations to enhance performance with reference to the discussion in Chapter 4 in the sections related to the analysis of the research data.

**Steps and Procedures for VLPM**

The literature review in Chapter 2 found that, in today’s business environment, a performance measurement system must exist to provide feedback for timely response, as well as monitoring and enhancement purposes. In Section 5.12, the research provides the steps and procedures that give guidance to organisations in the apparel industry to develop a VLPM index. At present, these steps and procedures do not exist in logistics management within the apparel industry.

**Business Process Re-engineering to Drive Continuous Improvement by VLPM**

With reference to Section 2.3.5 of the literature review in Chapter 2 about business process re-engineering and continuous improvement, the concept of business process re-engineering aims at achieving an organisation’s continuous improvements in critical measures of performance through the rethinking and radical redesigning a business process. Continuous improvement should be a way of life in today’s business environment. There have been discussions by scholars and practitioners about the benefits of performance measurement. The research provides insights into how VLPM supports continuous improvement by identifying the potential areas for improvement, as shown in Chapter 4 Section 4.10.3.

**Prototype Model for a Standardised Logistics Performance Measurement System**

The literature review in Chapter 2 discussed the reasons why organisations measure performance and how benchmarking helps organisations to achieve business improvement through organisations and individuals learning and developing. It also mentioned there are various worldwide recognised and standardised systems of measurement including: Time to Market; Balanced Score Card, Totally Quality Management and Activity Base Costing. These systems aim to help organisations
improve performance. Performance measures form part of these systems. Logistics management has now been recognised as an important business strategy. There is no standardised and recognised VLPM system exist. The research confirmed the importance and need for VLPM in the practical business environment. The resources of an organisation that support VLPM and thereby contribute to the continuous improvement of the organisation. The resources include the participation of strategic partners, senior executives and computer system development.

The study shows how VLPM supports an organisation to measure vendor logistics performance and identified criteria in operations areas for change and improvement. Discussed in detail in Section 5.6, the model illustrated in Figure 5-2 is proposed for the development of a standardised logistics performance measurement system that does not exist in today’s apparel industry. The model can be a prototype which can be further developed as an industrial recognised system.

5.5 Contributions to Policy and Practice

Policy

This research demonstrates the importance and need of VLPM for organisations. VLPM contributes to the continuous improvement of organisations. From a business point of view, the implementation of VLPM has significant business benefits not only for one party but for all the strategic partners including sourcing company, vendor and 3Pl involved in logistics operations. VLPM supports an organisation to achieve its business goals through measurement against properly defined measuring criteria. VLPM provides information on current performance status and identifies operational issues for improvement. It does this through the processes of monitoring, control, review and identification of potential areas of improvement. Organisations can develop process re-engineering to drive continuous improvement. Thus, VLPM is closely linked with continuous improvement and is essential for organisations to achieve their business goals. The researcher posed the question of how and why VLPM needs to be developed. This
study has found and confirmed that VLPM is needed by organisations. This is recognised by the practising executives who participated in this research.

**Practice**

The findings indicate there are no proper procedures or steps in the current business environment for the development and implementation of VLPM. The research concludes with suggestions for proper guidance that requires the restructure of current practices for organisations in the development and implementation of VLPM.

The suggested procedures/steps are as follows:

- **Senior Management Involvement** – Senior management needs to take ownership, and commit to making VLPM happen. It needs to champion the change, support the use of the necessary resources and provide the necessary organisational goals and business strategies.

- **Strategic Partners Involvement** – During the initial stages of VLPM development, strategic partners should be invited to participate from the beginning.

- **Criteria Setting** – VLPM measuring criteria need to be identified that are in line with the company goals and strategies.

- **Mutual Agreement** – VLPM measuring criteria and standards need to be defined with the mutual agreement and understanding by the strategic partner team.

- **Formal Structure** – VLPM needs to be formally structured so that all strategic partners follow the structure of VLPM in data collection and analysis.

- **Consistent measuring criteria** – Once criteria are defined, the measuring data should be consistently captured to ensure the measurement is properly tracked, traced and analysed and is comparable over time.
• IT – An IT or computer system needs to be developed for VLPM data capture, analysis and report preparation. The system can either be self-developed or it can be an external strategic partner’s system.

• Sharing of VLPM – VLPM results need to be shared with all strategic partners to ensure visibility so that there is no confusion or misunderstanding between partners on the performance results.

• Regular review – Upper management from the related strategic partners should set up regular scheduled meetings to review and discuss the VLPM results so as to identify potential improvement areas.

• Development and implementation of improvement actions – Once improvement areas are identified, the development of improvement actions should be agreed to by all the senior executive teams of the partners and signed off with mutual agreement and understanding of the changes and new requirements.

5.6 Proposed Model of VLPM for Apparel Industry Organisations

Based on the gap identifies and discusses in Chapter 2, the research findings and the suggest procedures and steps for the development of VLPM, Figure 5-2 provides a proposed VLPM model. The model encompasses logistics value chain management; vendor logistics performance measurement; and the three identified VLPM measurement criteria. It deals with how VLPM supports organisations to drive continuous performance improvement. Section 5.3 discusses the three criteria identified in this research that are based on the knowledge and practical experience of the three different groups of management and operations executives who are participants from the sourcing company, vendor and 3PL. The three criteria propose in this model are specific and practical, and are recognised by cross-functional management instead of only coming from the
customer’s perspective. In comparison with previous studies, the proposed VLPM model provides new empirical views on the following:

1) criteria setting
2) a standardised flow and process management of VLPM development and implementation
3) applicability for sourcing company, vendor and 3PL

Application of Proposed VLPM Model to Sourcing Company

The proposed model has been developed according to the summary of opinions from the participants in the research who are practising executives in Asia’s apparel industry and logistics operations. The criteria cover in the VLPM model are believed to be reputable, practical, and effective for the apparel industry. The model gives guidance and is applicable for organisations in the apparel industry to measure vendor logistics performance. The proposed VLPM has the potential to be developed as an industrial standard for apparel sourcing companies to benchmarking vendor logistics performance as long as it is broadly adopted.

Application of Proposed VLPM Model to Vendor

For vendors, the proposed VLPM could enable them to set a general performance index to review the operations. Since the criteria setting is based on the opinions of the apparel industry’s executives, the model’s criteria should be able to fulfill the requirements of customers in the apparel industry in the context logistics. Also, a vendor can proactively propose the model to the customers without a VLPM model. Again, the model has the potential to be developed as a general performance index recognised by the sourcing company once it has been broadly adopted. It can be a ‘one for all’ industrial standard so that vendors do not have to fulfill different requirements from customers. It can help
them more easily to identify their performance focus and manage or allocate resources effectively.

Figure 5-2 Proposed VLPM Model
Application of Proposed VLPM model to 3PL

The proposed VLPM can be applied to 3PL, if sourcing companies and vendors use the proposed model as a general VLPM standard in the market. It could help 3PL providers to focus on the development of service supports to achieve the criteria and fulfill the requirements of customers. Furthermore, 3PL can use the model as one of the service products to attract customers without a VLPM. If the 3PL supports the vendors by effectively complying with the VLPM model, it would be a good selling point for the 3PL to show potential customers as evidence of their effectiveness. It could help them to build a competitive advantage in the market place.

5.7 Limitations of the Research

There were two chief limitations of this study. The first concerns the size of the sample, which was limited by time and cost constraints, and other practicalities as discussed by Galetta (2013). As mentioned in Section 3.4. 4, based on experience and anecdotal evidence a PhD thesis requires about thirty five to fifty interviews (Perry, 1998). The researcher invited thirty participants from the researcher’s past working connections. Ideally, there would have been three interviews at different hierarchical levels of the organisations. However, it proved too difficult to conduct more than one interview in small Asian organisations (Perry, 1998). Therefore, the researcher interviewed only one participant in each of the thirty organisations. Again, due to limited resources of cost and time, the interviews themselves had to be limited as follows:

- The time for each interview was limited to one hour due to the busy working schedule of participants.
- The interview location was not always convenient for the participants, and the environment sometimes made a long conversation difficult.

The second major limitation of the study relates to its focus on logistics operations in Asia’s apparel industry. The application of these findings beyond logistics, or beyond Asia’s apparel industry, should be made with caution. There are operational, cultural, political, and social differences in the business environments of different industries,
operations and countries. However, the research has potential as a springboard for
generalising these results to other industries and countries. Further research should be
carried out to validate the findings from this research done in the Asian apparel industry,
in other organisations within or outside Asia, using either qualitative or quantitative
methodologies, or both.

5.8 Recommendations for Future Research

With reference to Section 2.7 of the literature review in Chapter 2, discussion and
empirical studies on the gap identified in this study are scarce. This research can serve as
a springboard, and the following further studies are suggested.

Application of Other Research Methodologies

This qualitative study does not approach to examine or measure experimentally and
quantitatively in amount, intensity, or frequency. The study focuses on meanings,
processes and the qualities of entities. In future, quantitative research could be used. In
Chapter 3, there are other research approaches discussed such as action research,
experiments and surveys. The research techniques could involve documents, observations
and questionnaires. These approaches and techniques could be used for further study to
test the theory related to this study.

Studies with Different Scope

The focus of this research is on Asia’s apparel industry. Similar research could be
conducted for particular cities in China or in countries which may have different cultural,
political, and social environments. Research could also be conducted on industries other
than the apparel industry so long as the industry involves vendor logistics operations.
Application of Proposed VLPM Model by Strategic Partners

The proposed VLPM model is described in Chapter 5 Section 5.14. Further study may be conducted to test the proposed VLPM model’s criteria setting, developmental steps and procedures. Furthermore, the application of the proposed model to sourcing companies, vendors and 3PL providers can be another further study topic.

Development of Computerised System for VLPM

Chapter 4, Section 4.6.4 discussed findings related to organisations using computer systems or IT systems for VLPM. The study finds that organisations use either internal or self-developed system or 3PL systems. Further study can focus on any standardised computer or IT system available or develop for VLPM.

Development of Standard Criteria for VLPM

In Chapter 5, Section 5.14, a propose VLPM model with three major criteria are outlined. The three criteria are On-Time Delivery, Quality of Shipment and Documents. Further study in the apparel industry can investigate standards that are acceptable and up to industrial standard for each of the three criteria.

Industry Recognition of Standardised VLPM

This study can be the springboard for VLPM development study. The researcher attempts to use this study to highlight the need to develop a recognised and standardised VLPM system for the apparel industry, as well as for other industries since such a system does not exist currently despite its importance.
5.9 Conclusion

This final chapter discusses the research findings for the four questions and two sub-questions. The findings came from research based on a case study approach and interview technique and they are compared with findings in the extant literature. The contributions of the research to theory, policy and practice are identified and discussed, addressing the research objective of understanding the benefits and requirements of VLPM for the apparel industry in China. A proposed model is provided and the limitations of the research are discussed. The research study finishes with recommendations for further studies. VLPM is important and worthy of further research, raising questions of theoretical and practical interest for researchers and practitioners in logistics management.
Reference List


Sandy Q. Qu John Dumay, (2011),"The qualitative research interview", Qualitative Research in Accounting & Management, Vol. 8 Iss 3 pp. 238 - 264


# Appendix I - Process of Building Theory from Case Study Research

**Process of Building Theory from Case Study Research**

<table>
<thead>
<tr>
<th>Step</th>
<th>Activity</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting Started</td>
<td>Definition of research question</td>
<td>Focuses efforts</td>
</tr>
<tr>
<td></td>
<td>Possibly a priori constructs</td>
<td>Provides better grounding of construct measures</td>
</tr>
<tr>
<td>Selecting Cases</td>
<td>Neither theory nor hypotheses</td>
<td>Reinforces theoretical flexibility</td>
</tr>
<tr>
<td></td>
<td>Specified population</td>
<td>Constrains excessive variation and sharpens external validity</td>
</tr>
<tr>
<td></td>
<td>Theoretical, not random, sampling</td>
<td>Focuses efforts on theoretically useful cases—i.e., those that replicate or extend theory by filling conceptual categories</td>
</tr>
<tr>
<td>Crafting Instruments and Protocols</td>
<td>Multiple data collection methods</td>
<td>Strengthens grounding of theory by triangulation of evidence</td>
</tr>
<tr>
<td></td>
<td>Qualitative and quantitative data combined</td>
<td>Synergistic view of evidence</td>
</tr>
<tr>
<td></td>
<td>Multiple investigations</td>
<td>Fosters divergent perspectives and strengthens grounding</td>
</tr>
<tr>
<td>Entering the Field</td>
<td>Overlap data collection and analysis, including field notes</td>
<td>Speeds analyses and reveals helpful adjustments to data collection</td>
</tr>
<tr>
<td></td>
<td>Flexible and opportunistic data collection methods</td>
<td>Allows investigators to take advantage of emergent themes and unique case lectures</td>
</tr>
<tr>
<td>Analyzing Data</td>
<td>Within-case analysis</td>
<td>Gains familiarity with data and preliminary theory generation</td>
</tr>
<tr>
<td></td>
<td>Cross-case pattern search using divergent techniques</td>
<td>Forces investigators to look beyond initial impressions and see evidence through multiple lenses</td>
</tr>
<tr>
<td>Sharpening Hypotheses</td>
<td>Iterative tabulation of evidence for each construct</td>
<td>Sharpens construct definition, validity, and measurability</td>
</tr>
<tr>
<td></td>
<td>Replication, not sampling, logic across cases</td>
<td>Confirms, extends, and sharpens theory</td>
</tr>
<tr>
<td></td>
<td>Search evidence for &quot;why&quot; behind relationships</td>
<td>Builds internal validity</td>
</tr>
<tr>
<td>Embedding Literature</td>
<td>Comparisons with conflicting literature</td>
<td>Rubric internal validity, raises theoretical level, and sharpens construct definitions</td>
</tr>
<tr>
<td></td>
<td>Comparison with similar literature</td>
<td>Sharpens generalizability, improves construct definition, and raises theoretical level</td>
</tr>
<tr>
<td>Reaching Closure</td>
<td>Theoretical saturation when possible</td>
<td>Ends process when marginal improvement becomes small</td>
</tr>
</tbody>
</table>

Source: Adapted from Eisenhardt (1989, p 533)
Appendix II - Test and techniques for establishing validity and reliable in case study research

<table>
<thead>
<tr>
<th>Case study design tests</th>
<th>Corresponding design tests</th>
<th>Case study techniques</th>
<th>Qualitative techniques</th>
<th>Phase of research in which techniques occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct validity</td>
<td></td>
<td>Use multiple sources of evidence</td>
<td>Data collection</td>
<td>Data collection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establish chain of evidence</td>
<td>Data collection</td>
<td>Data collection</td>
</tr>
<tr>
<td>Internal validity</td>
<td>Credibility</td>
<td>Have key informants review draft case study report</td>
<td>Data collection and data analysis</td>
<td>Data collection and data analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reliability (corresponding to objectivity and neutrality of position)</td>
<td>Data collection and data analysis</td>
<td>Researcher's data and report writing</td>
</tr>
<tr>
<td>External validity</td>
<td>Transferability</td>
<td>Do within-case analysis, then cross-case pattern matching</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do explanation-building</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td>Reliability</td>
<td>Dependability</td>
<td>Ensure internal coherence of findings and concepts are systematically related</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transcription of sources, investigators, and methods</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peer debriefing</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Member checks</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Researcher's assumptions, worldview, theoretical orientation</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Researcher self-monitoring</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Predetermined questions</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thick description (develop case study data matrix)</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cross-case analysis</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specific procedures for coding and analysis</td>
<td>Data analysis</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data collection</td>
<td>Data collection</td>
<td>Data collection</td>
</tr>
</tbody>
</table>

Source: Adapted from Riege (2003, p. 78-79)
Appendix III – Background of the Research Participants

**Vendor**

A code has been given to each of the participant. The code is preceded with the alphabet letters V (Vendor), followed by a sequence number starting from 01 based on the interview order in the group of Vendors.

**V01**

V01 has over 15 years’ logistics management experience. V01 was the director of a trading company operating all kinds of trades including agent, manufacturing and importer. V01 was responsible for the group supply chain management and with the company for four years at the time of the interview.

**V02**

V02 has over 20 years’ of logistics management experience. V02 was the Senior Shipping Manager of an apparel products manufacturer. V02 was responsible for the group logistics operations including air freight, ocean freight, and couriers operations. V02 joined the company for thirteen years and had been the Senior Shipping Manager for six years at the time of the interview.

**V03**

V03 has over 15 years in management. V03 was the General Manager of a manufacturer with factory base in China producing intimated products. V03 was with the company for 10 years as the General Manager and responsible for the overall operations of the company at the time of the interview.

**V04**
V04 has over 20 years in logistics management. V04 was the Shipping Supervisor of a trading company on import and export for apparel products. V04 was responsible for handing all shipping operations for incoming and outgoing from Hong Kong to Vietnam, United States of America and China. V04 was with the company for 12 years as the Shipping Supervisor at the time of the interview.

V05

V05 has over 18 years’ of logistics and shipping experience. V05 was the Senior Logistics Supervisor of a trading and manufacturer in apparel. V05 was responsible to assisting the manager to handle all daily shipping operations. V05 joined the company for 10 years and was the Senior Logistics Supervisor for 6 years at the time of the interview.

V06

V06 has over 15 years’ of experience in logistics and management. V06 was the Senior Logistic Manager of an apparel manufacturer. V06 was responsible for the logistics operations and management for Knit and Sweater in the company. V06 joined the company for 6 months as the Senior Logistics Manager at the time of the interview.

V07

V07 study transportation and logistics in University in Canada. V07 was the Business Executive of a manufacturer of intimate apparel. V07 was responsible to deal with the clients on costing and development then pass on information to the sourcing and logistics team for shipments. V07 joined the company for 7 years at the time of the interview.
V08 has over 12 years’ of experience in logistics operation and management. V08 was the Shipping Manager of a trading company on garment. V08 was responsible for manage all the staffs prepare shipments from China to Hong Kong, or oversea to Hong Kong for import and export. V08 joined the company for 15 years, and was the Shipping Manager for 8 years at the time of the interview.

V09

V09 has over 17 years’ of experience in logistics operations. V09 was the Shipping Manager of a garment factory. V09 was responsible to manage the import and export shipment operations. V09 joined the company for 16 years and was the Shipping Manager for 14 years at the time of the interview.

V10

V10 has over 20 years’ of experience in logistics management. V10 was the Director of a garment manufacturer. V10 was responsible to manage the accounting, logistics and HR operations. V10 joined the company for 20 years as the Director at the time of the interview.
Sourcing Company

A code has been given to each of the participant. The code is preceded with the alphabet S (Sourcing Company), followed by a sequence number starting from 11 based on the interview order in the group of Sourcing Company.

S11

S11 has over 12 years’ of experience in logistics management. S11 was the Logistics Director for Asia in a retailer and wholesaler of apparel and footwear. S11 was responsible for managing the company cargoes send out from factory to the Distribution Centre and ultimately delivery to the global market end customers. S11 joined the company for 4 years at the time of the interview.

S12

S12 has over 27 years’ of experience in sourcing field. S12 was the Vice President of a sourcing company for intimate products with its own brands in Canada and other international countries. S12 was responsible to leading several teams in Asia regions include sourcing and production team. S12 joined the company for 16 years and was the VP for less than a year at the time of the interview.

S13

S13 has over 15 years’ of experience in merchandizing. S13 was the Director of an intimate products company and responsible for leading the merchandising team to source for intimate products for the company’s own brands. S13 joined the company for 15 years and was the director for couple of months at the time of the interview.
S14

S14 has 15 years’ of management experience including 10 years of experience in logistics management. S14 was the Vice President of an apparel sourcing company in Far East Asia. S14 was responsible for finance and operations in the company. S14 joined the company over 5 years and was the Vice President for 2 years at the time of the interview.

S15

S15 has over 15 years’ of management experience in multiple industries from computing; business analysis; project management; retail operations and supply chain management. S15 was the Head of Compliance of an apparel and beauty products sourcing company. S15 was responsible for all the compliance and strategic sourcing operations of the company for all the regions outside United States of America. S15 joined the company for over 6 years and was in compliance and strategic sourcing for about 3 years at the time of the interview.

S16

S16 has over 25 years’ of experience in logistics operation and management. S16 was the Group Vice President in Asia & Europe of a Department Store operating company. S16 was responsible for all the operations for the company outside United States of America. S16 joined the company for 23 years and was the Group Vice President for over 15 years at the time of the interview.

S17

S17 has over 20 years’ of experience in logistics management. S17 was the Senior Regional Logistics Management of a sourcing office of one of the brand in apparel and footwear products. S17 was responsible for taking care of all the
shipments and logistics team to moving products in and out within Asia and Middle East. S17 joined the company for 4 years and was the Senior Regional Logistics Manager for 2 years at the time of the interview.

S18

S18 has over 6 years’ of experience in financial planning and analysis. S18 was the Senior Manager of the financial planning and analysis of an apparel sourcing company. S18 was responsible for financial planning and analysis team that part of the work was to build up some scorecard or KPI to measure the vendors and even measure the performance of the whole business. S18 joined the company for over 6 years and was the Senior Manager for 3 years at the time of the interview.

S19

S19 has over 6 years’ of experience in industrial engineering and management. S19 was the Supply Chain Project Manager of an apparel sourcing company. S19 was responsible for a lot of projects related to Supply Chain operations including packaging, logistics operations from raw materials to finished goods. S19 joined the company for 6 years and was the Supply Chain Project Manager for 2 years at the time of the interview.

S20

S20 has over 12 years’ of experience in logistics management. S20 was the Director of a sourcing company that involved apparel products. S20 was responsible for manage the supply chain operations from factories all the way to destinations and manage the Third Party Logistics Service Provider such as consolidators, truckers and warehouse partners’ performance. S20 joined the company for 5 years in the role of Director at the time of the interview.
**Third Party Logistics Service Provider (3PL)**

A code has been given to each of the participant. The code is preceded with the alphabet T (3PL), followed by a sequence number starting from 21 based on the interview order in the group of 3PL.

**T21**

T21 has over 12 years’ of experience in logistics operations and management. T21 was the Regional Development Director of a Logistics Service Provider. T21 was responsible to develop new business and monitoring the service performance with the Customer Service team in Asia. T21 joined the company for one and half years as the Regional Development Director at the time of the interview.

**T22**

T22 has over 10 years’ of logistics operation and management experience. T22 was the Senior Commercial Manager of a 3PL. T22 was responsible for providing service solution, quotation, and contracting with the customers. T22 joined the company for 3 years as the Senior Commercial Manager at the time of the interview.

**T23**

T23 has over 28 years’ of experience in logistics operation and management. T23 was the General Manager of a 3PL. T23 was responsible for the Trans-Pacific operations in taking care of the air freight shipments from Hong Kong to United States of America and Canada. T23 joined the company for 22 years and was the General Manager for 5 years at the time of the interview.
T24

T24 has over 7 years’ of experience in logistics operation and management. T24 was the Branch Manager of a 3PL and responsible for the entire branch operations. T24 joined the company for 7 years and was the Branch Manager for years at the time of the interview.

T25

T25 has over 7 years’ of experience in 3PL industry with over 4 years in management role. T25 was the Director Key Account Management of North Asia Region of a 3PL. T25 was responsible for maintain and grow partnership with the company’s key accounts; ensure service performance; develop solutions; delivery of supply chain initiative that improve cost efficiency and process effectiveness. T25 joined the company for 20 years and was the Director for 4 years at the time of the interview.

T26

T26 has over 12 years’ experience in 3PL management in various departments. T26 was the Customer Retention and Development Manager of a 3PL in the Hong Kong branch. T26 was responsible for handling key accounts for the branch and lead a team of accounts managers with major role to drive the business and also retention of the customers through the company committed service. T26 joined the company for 4 years and was the Customer Retention and Development Manager for 2 years at the time of the interview.

T27

T27 has over 10 years’ of experience in air freight operations and customers services. T27 was the Senior Manager of a global 3PL. T27 was the account
owner for fashion and retails in taking care of some major global accounts for
their daily operations in logistics scope. T27 joined the company for 2 years at the
time of the interview.

T28

T28 has over 20 years’ of experience in air freight operations. T28 was the
General Manager of the air freight department of a global 3PL and was
responsible for all the daily air freight operations and customer service. T28
joined the company for 20 years and was the General Manager for 3 years at the
time of the interview.

T29

T29 has over 18 years’ of experience in logistics management. T29 was the
Director of International Supply Chain of a global 3PL. T29 was responsible for
key accounts management, driving the operation excellence and to maintain sale
and service up to standard for customers. T29 joined the company for 4 years and
was the Director for around half year at the time of the interview.

T30

T30 has over 12 years’ of experience in air freight operations. T30 was the Sale
Development Manager of a global 3PL. T30 was responsible for sales in air
freight and was the assistance of the Vice President of the company covering the
area of China. T30 joined the company for 12 years and was the Sale
Development Manager for 2 years at the time of the interview.
## Appendix IV - Participants’ View on VLPM

<table>
<thead>
<tr>
<th>Participant Code</th>
<th>Participants View on VLPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>V01</td>
<td>Tight &amp; need to perform 100% to meet target.</td>
</tr>
<tr>
<td>V02</td>
<td>Customer requirements with penalty list.</td>
</tr>
<tr>
<td>V03</td>
<td>Like the operation procedures and the process how to deliver the commodity</td>
</tr>
<tr>
<td>V04</td>
<td>Very important to our company.</td>
</tr>
<tr>
<td>V05</td>
<td>Some requirements for the vendors to perform in logistics operations.</td>
</tr>
<tr>
<td>V06</td>
<td>To ensure they get the good on time according to require.</td>
</tr>
<tr>
<td>V07</td>
<td>A system in place which record all the data in terms of costing, shipping, production quality that apply to all factories. There is cost comparison that very critically to bench mark our customers.</td>
</tr>
<tr>
<td>V08</td>
<td>I think start from place the order until finished goods delivery to their WH.</td>
</tr>
<tr>
<td>V09</td>
<td>Check our document &amp; factory performance.</td>
</tr>
<tr>
<td>V10</td>
<td>Important to perform to avoid claims.</td>
</tr>
<tr>
<td>T21</td>
<td>The most important is about the transit time. Like the delivery time, cargo hand-over date, when we deliver the cargo to the DC.</td>
</tr>
<tr>
<td>T22</td>
<td>VLPM or we call KPI is customer’s predefine of service requirement or expectation to the vendors that according to the customer’s need. It develops to measure the performance of vendors.</td>
</tr>
<tr>
<td>T23</td>
<td>Depends on the customer whether they prefer and how they set the KPI.</td>
</tr>
<tr>
<td>T24</td>
<td>VLPM is the performance indicator the customers setting the expectation against the vendor which is very important that they would like the vendor to perform.</td>
</tr>
<tr>
<td>T25</td>
<td>Basically a set of rules, requirement that the customers have set which they require the vendor to meet and to perform.</td>
</tr>
<tr>
<td>T26</td>
<td>It is some kind of standard setting up to measure the vendor performance.</td>
</tr>
<tr>
<td>T27</td>
<td>Be a kind of criteria from customers which we must follow and approach their targets. It regards as aspect examine what we are &amp; where we are.</td>
</tr>
<tr>
<td>T28</td>
<td>It will be very good for us to establish the relationship and ask tighten the business between the logistics service provider and customer.</td>
</tr>
<tr>
<td>T29</td>
<td>It is basically the cooperation amount various parts, and particularly in measuring one of the party to do the greater good of the overall operation amount party.</td>
</tr>
<tr>
<td>S11</td>
<td>Important for logistics to keep looking at actions whenever it require.</td>
</tr>
<tr>
<td>S12</td>
<td>Important. A very good track record of delivery from vendor is very important.</td>
</tr>
<tr>
<td>S13</td>
<td>It measures the vendor delivery performance mainly on the on-time delivery performance.</td>
</tr>
<tr>
<td>S14</td>
<td>It is for continuous improvement. It identifies root cause on performance issues, vendors issues on process or system or itself company review on timeliness is important.</td>
</tr>
<tr>
<td>S15</td>
<td>It put me into of course we can measure more about logistics in addition to the two matrix we have. Like supply chain security, loss prevention, using quality trucking companies. How well they do with customs the documents is also very important.</td>
</tr>
<tr>
<td>S16</td>
<td>VLPM is the measure the performance of our vendors covering different merchandizing categories that we are purchasing from different countries.</td>
</tr>
<tr>
<td>S17</td>
<td>It is to measure the performance of the factories. We can dig out the information and ask the vendor to improve in some of the areas.</td>
</tr>
<tr>
<td>S18</td>
<td>I think it is one of the matrices that we want to make sure our vendor goods’ delivery to us on time.</td>
</tr>
<tr>
<td>S19</td>
<td>To me it pretty much likes a KPI of performance measuring in logistics.</td>
</tr>
<tr>
<td>S20</td>
<td>It means the measure to hold our vendor accountable and we will review the performance that regularly to see they hit our requirement.</td>
</tr>
</tbody>
</table>
Appendix V - 45 criteria used by the participants

<table>
<thead>
<tr>
<th>Measurement Criteria</th>
<th>No of Participants Use Criteria in VLPM</th>
<th>%</th>
<th>No. of Criteria</th>
<th>Criteria Distribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Time Delivery</td>
<td>30</td>
<td>100%</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>On Time Booking</td>
<td>11</td>
<td>36.67%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Time Documents</td>
<td>9</td>
<td>30.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Packaging</td>
<td>3</td>
<td>30.00%</td>
<td>3</td>
<td>≥ 30% to 39%</td>
</tr>
<tr>
<td>Documents Accuracy</td>
<td>8</td>
<td>26.67%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Time EDI/ASN/Data Transmission</td>
<td>7</td>
<td>23.33%</td>
<td>3</td>
<td>≥ 20% to 29%</td>
</tr>
<tr>
<td>Shipment Quantity Accuracy</td>
<td>7</td>
<td>23.33%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container Utilization</td>
<td>5</td>
<td>16.67%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit Time</td>
<td>4</td>
<td>13.33%</td>
<td></td>
<td></td>
</tr>
<tr>
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<tr>
<td>Labelling</td>
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<td>10.00%</td>
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<td>10.00%</td>
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<td></td>
</tr>
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<tr>
<td>Communication</td>
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<tr>
<td>Comply with Drop Ship Process</td>
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<td>Quality of Shipment</td>
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<td></td>
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<tr>
<td>Response Time</td>
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<td>3.33%</td>
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<td>Upstream Material</td>
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<td></td>
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<td>Missing &amp; Damage</td>
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<td>3.33%</td>
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<td>Scanning</td>
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<td>3.33%</td>
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<td>Container Loading Time</td>
<td>1</td>
<td>3.33%</td>
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<tr>
<td>Inspection</td>
<td>1</td>
<td>3.33%</td>
<td>32</td>
<td>≤ 9%</td>
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Total 30 Participants
## Appendix VI Criteria priority by no. of vote

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<tr>
<th>Criteria</th>
<th>No. of Votes</th>
<th>% by 30 Participants</th>
<th>No. of Vote By Priority</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>1st</td>
<td>2nd</td>
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<tr>
<td>On Time Delivery</td>
<td>16</td>
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<tr>
<td>Quality of shipment</td>
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<td>Documents</td>
<td>3</td>
<td>10%</td>
<td>1</td>
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<tr>
<td>Booking On Time</td>
<td>2</td>
<td>7%</td>
<td>1</td>
</tr>
<tr>
<td>Packing</td>
<td>2</td>
<td>7%</td>
<td>1</td>
</tr>
<tr>
<td>ASN Transmission</td>
<td>2</td>
<td>7%</td>
<td>1</td>
</tr>
<tr>
<td>Accuracy</td>
<td>2</td>
<td>7%</td>
<td>1</td>
</tr>
<tr>
<td>Container Utilization</td>
<td>1</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Code of Conduct</td>
<td>1</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td>1</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Service</td>
<td>1</td>
<td>3%</td>
<td></td>
</tr>
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<td>Compliance</td>
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<td>3%</td>
<td></td>
</tr>
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<td>Responsiveness</td>
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<td>3%</td>
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</tr>
<tr>
<td>All</td>
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<td>13%</td>
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<td>No idea</td>
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<td>13%</td>
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<tr>
<td>Other Comment</td>
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<td>10%</td>
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Appendix VII - Information Sheet for Interview

Information Sheet

Name of project  An Exploratory Study of a Vendor Logistics Performance Measurement for Logistics Management in Asia Apparel Industry

Introduction
My name is Leo Law and I am conducting a research as part of my Doctor of Business Administration (DBA) degree at Southern Cross University, a public University in Australia. My research is to explore and propose a new measurement on suppliers’ or vendor’s logistics activities performance that are being considered by management of apparel organizations in Asia.

As you work or used to work in logistics operations and management. I would like to solicit your assistance to share your views in this topic with me by participate in an interview.

What is this research?

The Asia-Pacific region is of vital importance to both purchasers and sellers that Asian economies are expected to a significant control of world trade within the beginning of twenty first century. According to a major international survey of supply chain performance in manufacturing companies reported that 90 per cent of the respondents believed that supply chain performance was important or very important for achieving competitive advantage in the future. Logistics has played an important strategic role of supply chain. Therefore, a performance measurement system that provides feedback for timely response, as well as monitoring and enhancement purpose must exist. There are literatures related to the discussion of logistics performance measurement that include matrix development and benchmarking but most are conceptual and generic. The discussion related to the topic of measuring vendors’ or suppliers’ logistics operation activities performance are scarce. This study intends to conduct an exploratory study of developing a new measurement mechanism concerned by logistics management in apparel industry. The result of study may help management to improve the performance of vendors or suppliers’ logistics operation activities.
What does this research involve?

This is an exploratory and interpretative research. It explore and propose the development of a vendor’s logistics performance measure that explain the interaction or concerns exhibited by the management in given the situation of measuring the vendor’s logistics performance. The main method used to identify the factors and their importance in measuring vendor’s logistics performance through interview to obtain the views, comments, concerns, expectations, experience and visions of research participants in measuring vendor’s logistics performance in apparel supply chain.

My responsibilities to you, the participants

My responsibilities to you are that:

1. I will explain to you all the details regarding this research, including your participation being entirely voluntary and that your identity will be protected during and after the research;
2. I will respect your wish to withdraw from the research and not use or remove materials obtained from you during the research;
3. I will be truthful to your views expressed to me and will not change them for whatever reason;
4. I will provide a summary of your views and comments for you to confirm whether my understanding and/or interpretation of your views are correct;
5. Your own identity and your organization’s identity, past or presence, will not be identifiable in my report or thesis.

Your (participants’) involvements in this research

Your involvement in this research is entirely voluntary. You may withdraw from the research at any time. You may also refuse to participate in the interview if you are not comfortable with it.

You are requested to answer all the questions during the interview according to your knowledge, experience and express views on the questions asked.

The likelihood and form of dissemination of the research results, including publication

The results of this research may be published in a peer-reviewed journal and/or presented at conferences, but only aggregated data will be reported. All the original information will be kept for seven years according to Southern Cross University research material retention policy but the notes will not have any identification to link them to any individual.
Participant’s Explicit Consent

Your explicit consent is required before the research will take place. This information sheet outlines the background and details of the research and will be retained by you. You are requested to sign a separate consent form which will be retained by the researcher for the purpose of proving that he has obtained your explicit consent before conducting the research.

Inquiries

If you (the participants in this research) have any query regarding the research, you may contact the researcher (Leo Law, Tel: +852 6102 3908, email: claw10@scu.edu.au) or the supervisor of this research (Dr Kasey Chang: +65 96948915, email: kasey.chang@scu.edu.au)

Feedback of the Research to you

The results of this research shall be published as part of a DBA thesis in 2012 and shall be available online in the Digital Thesis web site (http://adt.caul.edu.au/) within one year after thesis submission. If you want to receive results of this research please indicate it in the Consent Form and provide email or postal address.

This is a research approved by the Southern Cross University

This research has been approved by the Human Research Ethics Committee at Southern Cross University. The approval number is ECN-12-080

Complaints about the research/researchers

If you have concerns about the ethical conduct of this research or the researchers, you may write to:

The Ethics Complaints Officer
Southern Cross University
PO Box 157
Lismore NSW 2480
Email: ethics.lismore@scu.edu.au

All information sent to the Ethics Complaints Officers will be kept confidential and will be handled as soon as possible.
Appendix VIII - Consent Form

CONSENT FORM

Reminder: the consent form is to be returned to and retained by the researcher

Title of research project: An Exploratory Study of a Vendor Logistics Performance Measurement for Logistics Management in Asia Apparel Industry

Name of researcher: Leo Law

Name of Supervisor: Dr. Kasey Chang

(Contact details of the researcher and the supervisor are contained in the information sheet about this research)

NOTE: This consent form will remain with the Southern Cross University researcher for their records.

Tick the box that applies, sign and date and give to the researcher

I agree to take part in the Southern Cross University research project specified above. Yes ☐ No ☐

I have been provided with information at my level of comprehension about the purpose, methods, demands, risks, inconveniences and possible outcomes of this research, including any likelihood and form of publication of results. Yes ☐ No ☐

I agree to be interviewed by the researcher Yes ☐ No ☐

I agree to make myself available for further interview if required Yes ☐ No ☐

I agree to complete questionnaires asking me about my views on the logistics performance measurements Yes ☐ No ☐

I understand that my participation is voluntary Yes ☐ No ☐

I understand that I can choose not to participate in part or all of this research at any time, without negative consequence to me Yes ☐ No ☐
I understand that any information that may identify me, will be de-
identified at the time of analysis of any data. Therefore, any
information that I have provided cannot be linked to me (Privacy
Act 1988 Cth) Yes □ No □

I understand that all information gathered in this research is
confidential. It will be kept securely and confidentially for 7 years at
the University Yes □ No □

I am aware that I can contact the supervisor or researcher at any
time with any queries Yes □ No □

I understand that the ethical aspects of this research have been
approved by the SCU Human Research Ethics Committee Yes □ No □

If I have concerns about the ethical conduct of this research,
I understand that I can contact the SCU Ethics Complaints Officer
Yes □ No □

Participant’s name: ______________________________________

Participant’s signature: ___________________________________

Date: __________________________________________________

☐ Please tick this box and provide your email address or mail address (will be treated
as confidential) below if you wish to receive a summary of the results:

Email: __________________________________________________

Mailing address: ________________________________________
Appendix IX - Interview Questions for Vendor Customer (Sourcing Company)

Name of Project: An Exploratory Study of Vendor Logistics Performance Measurement for Logistics Management in Asia Apparel Industry

(For apparel vendor’s customer)

A. Background Information

1. Please tell me about the business nature of your current organisation.
2. What is your current position, roles and responsibilities in your organisation?
3. Please tell me about your experience in Logistic operations, or management
4. How long have you been with the organisation, and how long have you been in your current role?
B. Questions on Vendor Logistics Performance Measurement (VLPM)

1. Does your organisation use VLPM? If no, why?

2. What does the VLPM means to you?

3. How formal is your organisation develop the VLPM?
   a. If informal, how VLPM being created, identified and executed?
   b. If formal, how is the VLPM executed against the definition?

4. Which level in the organisation produces the VLPM? (i.e. Senior Executive, Functional Head, Division Head)

5. Who is/are involved in the development of the VLPM?

6. How important is the VLPM in your organisation?

7. What are the main criteria used in the VLPM? Are there any specific criteria used in the VLPM?
   a. If yes, why are the specific criteria used in the VLPM?
   b. If no, why?

8. How important do you feel is to have the specific criteria used in the VLPM?

9. How does your organisation prioritize the criteria in the VLPM?

10. How are the selected criteria being measured? (Yearly, Monthly, Weekly)

11. Does your organisation have a data base of VLPM?

12. How frequently is your organisation review the VLPM? (Regularly, once per year, or as required) If as require, what trigger the review? Why?

13. Which level leads the review of the VLPM?

14. Does your organisation encourage VLPM sharing? (Internal and/or with Vendor and Third Party Logistics)
   a. If yes, how VLPM is shared?
   b. If no, why?

15. Does your organisation review the VLPM with Vendor and/or Third Party Logistics?
a. If yes, which level from vendor, or/and third party logistics involve in the review.
b. If no, why?

16. How does your organisation address the performance issues from the VLPM? (Internal and/or with Vendor and Third Party Logistics)

17. How much has the organisation change the criteria, and/or the performance standard in the VLPM you are now using from those in the recent past?

18. How important do you feel it is to have a VLPM to support your organisation’s continuous improvement?

19. In what area(s) do you think the VLPM helps your organisation’s continuous improvement?

20. Do you think the VLPM benefit to your Vendor, Logistics Service Provider, and/or any others?
   a. If yes, how?
   b. If no, why?

- Thank you -
Appendix X - Interview Questions for Vendor and Third Party Logistics

Name of Project: An Exploratory Study of Vendor Logistics Performance Measurement for Logistics Management in Asia Apparel Industry

(For Apparel Vendor and Third Party Logistics)

A. Background Information

1. Please tell me about the business nature of your current organisation.

2. What is your current position, roles and responsibilities in your organisation?

3. Please tell me about your experience in Logistic operations, or management

4. How long have you been with the organisation, and how long have you been in your current role?
B. Questions on Vendor Logistics Performance Measurement (VLPM)

1. Do any of your customers use VLPM? If no, why?

2. What does the VLPM means to you?

3. How formal are your customers develop the VLPM?
   a. If informal, how VLPM being created, identified and executed?
   b. If formal, how is the VLPM executed against the definition?

4. Which level in your customers produces the VLPM? (i.e. Senior Executive, Functional Head, Division Head)

5. Does your organisation involve in the development of your customers VLPM?
   a. If yes, which level is/are involved?
   b. If no, why

6. How important is the customers’ VLPM to your organisation?

7. What are the main criteria your customers used in the VLPM? Are there any specific criteria used in the VLPM?
   a. If yes, why are the specific criteria used in the VLPM?
   b. If no, why?

8. How important do you feel is to have the specific criteria used in the VLPM?

9. How do your customers prioritize the criteria in the VLPM?

10. How are the selected criteria being measured? (Yearly, Monthly, Weekly)

11. Do your customers have a data base of VLPM?

12. How frequently is your customers review the VLPM? (Regularly, once per year, or as required) If as require, what trigger the review? Why?

13. Which level in your customers leads the performance review of the VLPM?

14. Does your customer share the VLPM with your organisation?
   a. If yes, how?
   b. If no, why?
15. Does your organisation involve in the review of the customers’ VLPM?
   a. If yes, which level from your organisation involve in the review?
   b. If no, why?

16. How do your customers address the performance issues from the VLPM?

17. How much have the customers change the criteria, and/or the performance standard in the VLPM you are now using from those in the recent past?

18. How important do you feel it is to have a VLPM to support your customers’ continuous improvement?

19. In what area(s) do you think the VLPM benefit your customers’ continuous improvement?

20. Do you think the customers’ VLPM benefit to your organisation?
   a. If yes, how?
   b. If no, why?

- Thank you -
## Appendix XI - Questions Relationship with Research Issue

### Questions Relationship with Research Issue

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<tr>
<th>Question No.</th>
<th>Question for Vendors &amp; 3PL</th>
<th>Research Issue</th>
<th>Question No.</th>
<th>Question for Sourcing Company</th>
<th>Research Issue</th>
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<td>1</td>
<td>Do any of your customers use vendor logistics performance measurement (VLPM)? A. Yes, how?</td>
<td>I-1</td>
<td>1</td>
<td>Does your organization use vendor logistics performance measurement (VLPM)? If no, why?</td>
<td>I-1</td>
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<td>2</td>
<td>How important do your customers develop the VLPM? a. If informal, how VLPM being created, identified and executed? b. If formal, how is the VLPM executed against the definition?</td>
<td>I-1, I-2, I-3</td>
<td>2</td>
<td>What does the VLPM mean to you?</td>
<td>I-3</td>
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<tr>
<td>3</td>
<td>Which level in your customers produces the VLPM? (i.e. Senior Executive, Functional Head, Division Head)</td>
<td>I-1, I-3, I-11</td>
<td>3</td>
<td>Whose level in the organization produces the VLPM? (i.e. Senior Executive, Functional Head, Division Head)</td>
<td>I-1, I-3, I-11</td>
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<tr>
<td>4</td>
<td>How important do your organization involve in the development of your customers VLPM? a. If yes, which level is/are involved? b. If no, why?</td>
<td>I-1</td>
<td>4</td>
<td>How important is the development of the VLPM?</td>
<td>I-3</td>
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<td>5</td>
<td>Which level in your organization approves the criteria in the VLPM? a. If yes, which level approves the criteria in the VLPM? b. If no, why?</td>
<td>I-1, I-2, I-4</td>
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<td>Which level approves the criteria in the VLPM?</td>
<td>I-1, I-2, I-4</td>
</tr>
<tr>
<td>6</td>
<td>How important are the criteria in the VLPM? a. If yes, which criteria in the VLPM are important? b. If no, why?</td>
<td>I-2, I-3, I-4</td>
<td>6</td>
<td>How important are the criteria in the VLPM?</td>
<td>I-2, I-3, I-4</td>
</tr>
<tr>
<td>7</td>
<td>How frequently is your organization reviewing the performance of the VLPM? a. If yes, how frequently is the VLPM being reviewed? b. If no, why?</td>
<td>I-1, I-3, I-4</td>
<td>7</td>
<td>How frequently is your organization reviewing the performance of the VLPM?</td>
<td>I-1, I-3, I-4</td>
</tr>
<tr>
<td>8</td>
<td>How frequently is your organization reviewing the VLPM? (Regularly, once per year, or as required) If as required, what trigger the review? Why?</td>
<td>I-1, I-4</td>
<td>8</td>
<td>How frequently is your organization reviewing the performance of the VLPM?</td>
<td>I-1, I-4</td>
</tr>
<tr>
<td>9</td>
<td>Which level leads the performance review of the VLPM?</td>
<td>I-1, I-3, I-4</td>
<td>9</td>
<td>Which level leads the performance review of the VLPM?</td>
<td>I-1, I-3, I-4</td>
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<td>10</td>
<td>How does your organization prioritize the VLPM? (Yearly, Monthly, Weekly)</td>
<td>I-2, I-3, I-4</td>
<td>10</td>
<td>How does your organization prioritize the VLPM?</td>
<td>I-2, I-3, I-4</td>
</tr>
<tr>
<td>11</td>
<td>How important do you feel is to have the specific criteria used in the VLPM?</td>
<td>I-1, I-3, I-4</td>
<td>11</td>
<td>How important do you feel is to have the specific criteria used in the VLPM?</td>
<td>I-1, I-3, I-4</td>
</tr>
<tr>
<td>12</td>
<td>How important do you feel is to have the specific criteria used in the VLPM? (Yearly, Monthly, Weekly)</td>
<td>I-1, I-3, I-4</td>
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<td>How important do you feel is to have the specific criteria used in the VLPM?</td>
<td>I-1, I-3, I-4</td>
</tr>
<tr>
<td>13</td>
<td>Which level produces the VLPM? (i.e. Senior Executive, Functional Head, Division Head)</td>
<td>I-1, I-3, I-4</td>
<td>13</td>
<td>Which level produces the VLPM?</td>
<td>I-1, I-3, I-4</td>
</tr>
<tr>
<td>14</td>
<td>How important is the VLPM in your organization? a. If yes, how? b. If no, why?</td>
<td>I-1, I-3, I-4</td>
<td>14</td>
<td>How important is the VLPM in your organization?</td>
<td>I-1, I-3, I-4</td>
</tr>
<tr>
<td>15</td>
<td>How important do you feel is to have the VLPM sharing? (Internal and/or with Vendor and Third Party Logistics) A. If yes, how? B. If no, why?</td>
<td>I-1, I-3, I-4</td>
<td>15</td>
<td>How important do you feel is to have the VLPM sharing?</td>
<td>I-1, I-3, I-4</td>
</tr>
<tr>
<td>16</td>
<td>How do your customers address the performance issues from the VLPM?</td>
<td>I-1, I-3, I-4</td>
<td>16</td>
<td>How do your customers address the performance issues from the VLPM?</td>
<td>I-1, I-3, I-4</td>
</tr>
<tr>
<td>17</td>
<td>How much has the organization change the criteria, and/or the performance standard in the VLPM you are now using from those in the recent past?</td>
<td>I-1, I-3, I-4</td>
<td>17</td>
<td>How much has the organization change the criteria, and/or the performance standard in the VLPM you are now using from those in the recent past?</td>
<td>I-1, I-3, I-4</td>
</tr>
<tr>
<td>18</td>
<td>In term of continuous improvement, do you think the VLPM benefit to your organization? A. If yes, how? B. If no, why?</td>
<td>I-2, I-3, I-4</td>
<td>18</td>
<td>In term of continuous improvement, do you think the VLPM benefit to your organization?</td>
<td>I-2, I-3, I-4</td>
</tr>
<tr>
<td>19</td>
<td>How important do you feel is to have a VLPM to support your organization’s continuous improvement?</td>
<td>I-2, I-3, I-4</td>
<td>19</td>
<td>How important do you feel is to have a VLPM to support your organization’s continuous improvement?</td>
<td>I-2, I-3, I-4</td>
</tr>
<tr>
<td>20</td>
<td>How does the VLPM benefit to your organization? a. If yes, how? b. If no, why?</td>
<td>I-1, I-3, I-4</td>
<td>20</td>
<td>How does the VLPM benefit to your organization?</td>
<td>I-1, I-3, I-4</td>
</tr>
<tr>
<td>21</td>
<td>Does the VLPM benefit your Vendor, Logistics Service Provider, and/or any others? A. If yes, how? B. If no, why?</td>
<td>I-1, I-3, I-4</td>
<td>21</td>
<td>Does the VLPM benefit your Vendor, Logistics Service Provider, and/or any others?</td>
<td>I-1, I-3, I-4</td>
</tr>
</tbody>
</table>