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THE STRATEGIC IMPORTANCE OF SUPPLY CHAIN MANAGEMENT IN SMALL AND MEDIUM SIZED ENTERPRISES.

A CASE STUDY OF THE GARMENT INDUSTRY IN

SRI LANKA

BY

H.M RENUKA PUSHPANJALEE HERATH

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Abstract

This research concerns SMEs in the Sri Lankan garment manufacturing and export industry and explores success factors in managing their supply chains. The overall aim of the study is to better understand successful supply chain management (SCM) practices which have been implemented by SMEs in the Sri Lankan garment exporting industry and the obstacles faced in their implementation.

Eight telephone interviews were followed by 20 in-depth, face-to-face interviews with senior managers in Sri Lanka. Documentary evidence was also collected and analysed. Combined with a literature review on manufacturing operations, the data collection led to the development of three criteria for the selection of cases for the research: 1) maintaining direct contacts with foreign buyers, 2) shorter lead times and 3) high value added of products. Based on these three criteria, a sample of six cases: three firms that exercised 'more successful' SCM strategies and three characterised by 'less successful' SCM strategies were selected. Data were analysed using NVivo10 software with a combination of theoretically derived codes and indigenous codes as the coding strategy.

Successful SCM strategies and constraints on improving SCM performance were identified based on each factor considered: lead time, value added and direct contacts related. While both macro and micro-environmental factors influence SME performance, the micro-environmental ones (in particular the lack of strategic business thinking, a weak resource base, resistance to business risk and low profit marginal niches) were far more salient. Further to this, the lack of a fabric manufacturing base within Sri Lanka is a common barrier for both 'more' and 'less successful' companies while company-specific successful strategies and constrains also were evident. The absence of direct contact with foreign buyers is critical for 'less successful' companies as it has led these companies to work with intermediaries. Critical supply chain decisions have to be channelled via buying offices, which leave these companies at risk. The findings add to a growing body of literature on the role of international buying offices and their impact on the implementation of SCM strategies' by exporting SMEs.

Acknowledgements

Table of Contents

List of Tables

List of Figures

List of Abbreviations

AfDB	African Development Bank
AM	Agile Manufacturing
AT	Agency Theory
BOI	Board of Investment
CAD	Computer Aided Design
CAM	Computer Aided Manufacturing
CBSL	Central Bank of Sri Lanka
CMI	Co-Managed inventory
CSCMP	Council of Supply Chain Management Professionals
EDB	Export Development Board
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
EU	GSP European Union-Generalized System of Preferences
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IADB	Inter-American Development Bank
IDB	Industrial Development Board
IMF	The International Monetary Fund
JAAF	Joint Apparel Association Forum
JIT	Just-In-Time
KEPZ	Katunayake Export Processing Zone
LCL	Low Cost Labour
LEs	Large Enterprises
LM	Lean Manufacturing
MFA	Multi Fibre Arrangement
MIF	Multilateral Investment Fund
MRP	Material Requirement Planning
MRP11	Manufacturing Resources Planning

PC-GNI	Annual per Capita Gross National Income
QR	Quick Response
RBV	Resource-Based View
RFID	Radio Frequency Identification
RMGs	Ready-Made Garments
SAARC	South Asian Association for Regional Cooperation
SAP	Structural Adjustment Programmes
SBA	Small Business Administration
SCM	Supply Chain Management
SLAEA	Sri Lanka Apparel Exporters Association
SLCGE	Sri Lanka Chamber of Garment Exporters
SMEs	Small and Medium Sized Enterprises
SN	Social Network
SNT	Social network
TCA	Transaction Cost Approach
TDA	Trade and Development Act
TVEC	Tertiary and Vocational Education Commission
UNDP	United Nations Development Program

Chapter 1. Introduction

1.1 Introduction

The Sri Lankan garment industry developed in the mid-1970s as an export-oriented industry following the introduction of the Open Economy Policy in 1977. Over the last few decades it has demonstrated a remarkable upward trend in terms of value of total exports. In 1977 the garment industry accounted for 2% of total exports, which had increased to 46% by 2005 (Central Bank Statistics, 2005). This growth has occurred within an industry structure where approximately 75% of companies are small to medium sized enterprises. Today the garment industry occupies a prominent position in Sri Lanka's industrial structure. It is the largest employer amongst the country's manufacturing industries, (with 42% of manufacturing employment (Board of Investment Statistics, 2009), and is the largest export earner (Kelegama, 2009) accounting for 69% of total exports (Board of Investment Statistics, 2009). The industry is also the country's largest foreign exchange earner accounting for 46% of the foreign income to the country (Board of Investment Statistics, 2009). Therefore the role played by the garment industry is substantial in the Sri Lankan economy as a source of employment and earning foreign income. However, the industry is losing a competitive advantage in part due to weak SCM practices and specifically long lead times (Tirimanne and Ariyawardana, 2008).

This research aims to examine the Supply Chain Management (SCM) practices of small and medium sized enterprises (SMEs) in the Sri Lankan garment industry. The opening chapter of this thesis introduces, contextualises and positions the research in relation to SMEs and the garment industry of Sri Lanka. This chapter begins by defining SCM and the fit between SCM and SMEs. Next, the research problem, research aim and objectives are followed by a summary of the research strategy. The structure of the body of the thesis is presented at the end of the chapter.

1.2 Definitions of SCM

Supply Chain Management has been influenced by the disciplines of marketing, economics, operations management, international business, business strategy, organisational management and information technology (Croom *et al.,* 2000). Given these disciplinary influences, SCM has been discussed from various theoretical viewpoints which are discussed in Section 2.4.2. SCM includes several inbound (suppliers of raw material and parts, transport providers) and outbound (wholesalers, retailers) entities operating at different stages of supply chain. SCM has been defined in relation to different backgrounds such as the flow of products (Thomas and Griffin, 1996), management philosophy (Mentzer *et al.,* 2001) and management process (Tyndall *et al.,* 1998). These disparate definitions of SCM have limited the research, managerial and teaching progress in the subject (Mentzer *et al*., 2001). However, as a result of a broad examination of diverse definitions, Mentzer *et al.* (2001) propose definitions for supply chain and SCM as follows;

> "[A supply chain is a] *set of three or more entities directly involved in the upstream and downstream flow of products, services, finances and information from a source to the customer"* (Mentzer *et al.,* 2001, p.4).

> "[SCM is] *the systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purpose of improving long-term performance of the individual companies and the supply chain as a whole"* (Mentzer *et al.,* 2001, p.18).

These two definitions are used as operational definitions for this research as they were developed by considering many other definitions and thus cover the majority of aspects of the concepts.

According to the Council of Supply Chain Management Professionals (CSCMP), supply chain management encompasses the planning and management of all activities involved in sourcing, procurement, conversion, and logistics management. It also includes the coordination and collaboration with channel partners, which can be suppliers, intermediaries,

third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies (CSCMP, 2011).

In general, a supply chain includes the activities of information systems management, sourcing and procurement, production scheduling, order processing, inventory management, warehousing, customer service and after-market disposition of packaging and materials. Thus, the integration of these activities through improved relationships ensures a sustainable competitive advantage. The proper integration of these activities will also add more value to the final products and services than the entire cost of these activities (Porter, 1990).

This research focuses on the strategic importance of SCM strategies in small and medium sized enterprises (SMEs) in the Sri Lankan garment industry. The Asian Textile Industry (2007) estimates that more than 75% of apparel industry firms in Sri Lanka are SMEs and it is the leading export earner in Sri Lanka's industrial structure (Kelegama, 2009). SCM bears the responsibility of developing and implementing supply structures that will enhance the competitive position of the firm. Hence SCM considers both input purchasing and transition and management of output (goods and services). SCM is capable of a firm's competitiveness through several ways such as reduced cost of material, cycle times and time taken for the products to come into the market. Further SCM facilitates the innovation potential of an organisation. Previous research which is discussed in Section 2.4 clearly demonstrates the importance of SCM strategies for an organisation. SCM practices lead to higher levels of operational performance of all manufacturing firms (Bayraktar *et al.,* 2009). This argument is also common to SMEs. Therefore identifying the importance of SCM strategies in developing SMEs is of prime important for an economy. SMEs generate employment and boost economic growth especially in developing nations. More than 50% of the employment and added value in most countries (UNCTAD, 1993) are from SMEs. They contribute significantly to an economy's profits and play a crucial role in the well-being and long term development of a nation (Fan *et al.,* 2005). However, when compared to the Large Enterprises (LEs), survival is a challenge to SMEs due to their limited resources. Furthermore SMEs face other specific challenges of low cost products flooding the market

from countries such as China and India. Therefore, SMEs should prepare themselves with requirements to face challenges coming from rapid globalisation and intense competition.

1.3 Prior Research: Fit Between SCM and SMEs

Arend and Wisner (2005) discussed the relationship between SCM and SMEs. They stress the benefits SMEs can obtain through SCM, such as improving product quality, lower cost, higher customer service and reducing risk. Corbet *et al.* (1999) described the benefits of SCM as increased market share, inventory reductions, improved delivery service, improved quality and shorter product development. Further Grove (1998) highlighted the benefits of implementing an effective supply chain. It was recognised that increased competitiveness for all customers, implementation of medium/long-term planning actions, increased profitability, design excellence and improved supplier self-understanding can be achieved through a smooth functioning of well-organised SCM. Koh *et al.* (2007) identified the fact that the implementation of effective SCM practices has a direct impact on increasing the operational performance of SMEs. Hong and Jeong (2006) examined the impacts SMEs have on supply chain implementation through serving the roles of suppliers, distributors, producers and customers. SMEs require a properly integrated decision making system in terms of a coordinated strategic supply chain positioning to ensure they maintain competitive advantage and survive competently in worldwide competition (Lim *et al.,* 2006). Williams (2006) explained the possibility of gaining competitive advantages by the smaller organisations through execution of an improved SCM. Bhutta *et al.* (2007) explored the SCM practices of SMEs in Pakistan and showed that the firms with good SCM practices were 'more successful' than the firms that did not have good SCM practices. The SCM practices implemented and problems faced by SMEs are discussed in detail in Section 2.3.7. Therefore it is evident that SCM plays a significant role in solving the problems SMEs face.

A limited number of studies have been carried out on the Sri Lankan SME sector and none of them focused on SCM issues faced by SMEs (see for example; Kelegama, 2005:2009; Tilakaratne, 2006; Kelegama and Wijayasiri, 2004; Kelegama and Epaarchchi, 2002, Tirimanne and Ariyawardana, 2008). Background information on the Sri Lankan SME sector and the case for why Sri Lankan SMEs should be developed is presented in Section 2.3.4.

Currently it is an informal sector which demands a policy level intervention to improve. Therefore there is a strong need to address the problems Sri Lankan SMEs face and bring policy level solutions to improve them. This research will contribute to the development of SMEs as it will generate new information about the successful SCM strategies of Sri Lankan garment exporting SMEs and the barriers they face towards improving them. Overall, this thesis is aimed at contributing to knowledge of and an understanding of an underdeveloped field within the SCM literature and making practical recommendations for the implementation of successful SCM strategies for garment exporting SMEs in Sri Lanka.

Figure 1 shows the breakdown of manufacturing firms by districts. It is apparent from this figure that Colombo (37.12%) and Gampaha (45.5%) are the two main districts that account for the highest concentration (including large scale manufacturing firms) of manufacturing industry in the country. These two districts along with the district of Kaluthara (17.1%) make the western province account for the lion share of manufacturing firms in the country, quite out of proportion to other provinces. Only a very small share (0.28%) accounts for the presence of manufacturing industries in all other districts. It can therefore be said that manufacturing firms in the western province make a substantial contribution to the area in terms of value addition to the economy and employment of persons (Department of Census and Statistics, 2003). Therefore this research is focused on SMEs located in the western province of Sri Lanka which manufacture and export garments.

Figure 1: Percentage of Manufacturing Firms by Districts
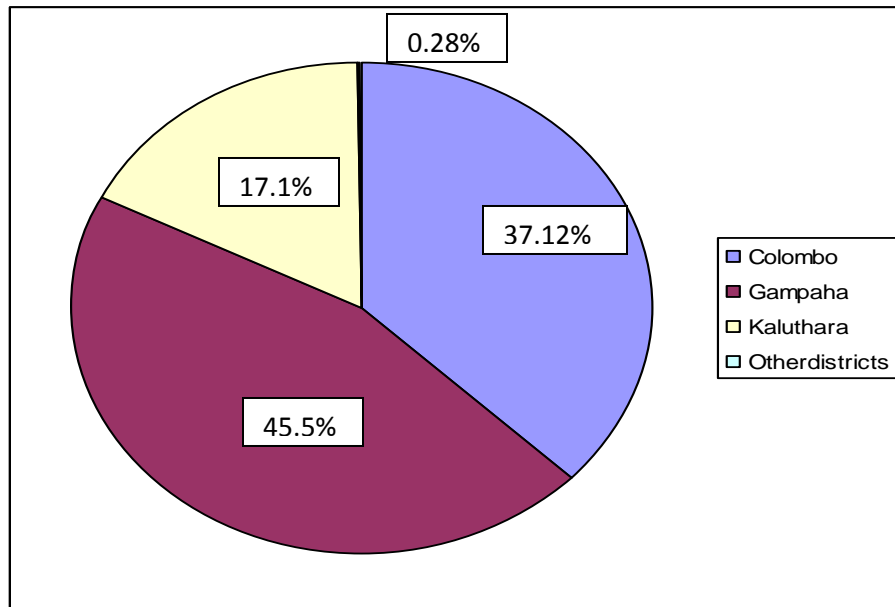
Source: Department of Census and Statistics (2003)

1.4 Research Problem

The Sri Lankan garment industry is losing its competitive advantage principally due to the long lead times (Tirimanne and Ariyawardana, 2008). Generally speaking, purchasing plays a major role because it is one of the main areas that tend to incur high expenditure. In order to realise adequate profits it is essential to reduce the cost of purchasing. In this scenario supply chain management has become a vital issue in the Sri Lankan garment industry. According to Porter (1980), an organisation can obtain competitive advantage through cost leadership and differentiation. Purchasing is a crucial factor in the Sri Lankan garment industry which decides the level of profitably in the industry because it consists of a high proportion of bought-out items of fabrics and accessories. Therefore, based on Porter's theory, the Sri Lankan garment industry can achieve cost leadership through proper purchasing management.

Further, the Sri Lankan garment industry presently operates in a post quota period, because at the end of 2004 the Multi – Fibre Arrangement (MFA) ended. The MFA guaranteed the market for the Sri Lankan Ready Made Garment (RMG) sector which was a driving force

behind the remarkable growth of the garment industry (Kelegama 2009), but now it has to operate under quota free conditions world, under more competitive pressures from other low cost manufactures such as China, India and Singapore.

According to JAAF (Joint Apparel Association Forum), the principal body of Sri Lanka's garment industry, approximately 350 exporting companies exist in the Sri Lankan garment industry. Of these, 75% are SMEs and the remainder are large companies. However SMEs only account for 25% of the export volume of the country's apparel and large firms account for 75%. Thereby, it shows a marked disparity in terms of the export volume development of larger firms and SMEs in the garment industry. Clearly the majority of the apparel exporting SMEs has to be developed to operate at a higher volume level.

Within such a background this research focuses exclusively on SMEs as although they account for only 25% of total garment exports, the majority of the garment industry operators are SMEs. Moreover the literature on Sri Lankan SMEs highlights significant constraints faced by the sector contributing to weak export performance (see Section 2.3.6) and the literature on the garment industry stresses its importance to the Sri Lankan economy (see Section 2.4.1). SCM issues are identified as of vital importance in determining the overall performance of SMEs both within the garment industry and other sectors (see Section 2.4.8). Putting these elements together suggests that a detailed focus on SMEs is warranted. The literature review provides a more detailed explanation of the need for the research in terms of both the theoretical and commercial contexts and from the viewpoints of both SCM and SMEs.

1.5 Aim of the Research

This research aims to identify the barriers and facilitators to successful SCM practices and discusses the implications of these for the Sri Lankan garment industry.

1.6 Objectives of the Research

In order to realise the research aim for this research project, the following research objectives were defined.

1. To critically review the factors that determine the success of SCM strategies through a review of the literature.

2. To explore the factors that have contributed to the implementation of successful SCM strategies by SMEs in the Sri Lankan garment exporting industry.

3. To examine the barriers faced by Sri Lankan garment exporting SMEs in implementing improved SCM strategies.

4. To examine the success factors for an effective SCM strategy in a garment manufacturing and exporting SMEs.

5. To discuss the implications of the research findings for the Sri Lankan garment industry.

1.7 Research Questions

Therefore following the research objectives, three research questions were identified as follows;

1. How successfully have supply chain management strategies been implemented by SMEs in the Sri Lankan garment export industry?

2. Why do SMEs in the Sri Lankan garment export industry find it difficult to implement effective SCM strategies?

3. How can a garment manufacturing and exporting SME ensure the efficient functioning of an effective, successful SCM strategy?

1.8 Research Strategy

The Figure 2 summarises the strategy of the research. As shown, the first, exploratory phase of data collection was based on telephone interviews related to SCM practices of selected garment exporting SMEs of Sri Lanka. In the second phase of data collection, qualitative case studies were carried by virtue of in-depth interviews with SCM related decision makers of selected garment exporting SMEs of Sri Lanka and relevant documentary evidence also were collected. The final phase of data collection was intended to expand the boundaries of knowledge relating to Sri Lankan SMEs with a new body of knowledge about the successful SCM strategies of Sri Lankan garment exporting SMEs and the obstacles to improve them. Throughout the data collection process, knowledge was informed by an extensive, but not exhaustive, review of the scholarly literature on theories relating to SMEs and supply chain management.

Thus, the aim and the objectives of this research encompass qualitative aspects and was mainly a qualitative research. Furthermore the case study method is a common approach to SCM research, and it can be used to review both intra- and inter-organisational interactions and relations. Case based research is more relevant to explore the ways and reasons of taking place certain events (Yin, 1994). Further, Hartley (1994) says that the results of case study research can be strengthened by including other sources of information such as documentary evidences and meeting records of organisations. The methodology chapter (chapter 3) further explains the reasons for using case method for this research.

Figure 2: Research Strategy

Theoretical input from the literature- **RO1-** To critically review the factors that determine the success of SCM strategies through a review of the literature

Phase	Phase 1 (Exploratory): Exploratory telephone interviews	Phase 2 (Case Studies): Review of documentary evidence and qualitative in-depth interviews with the SCM related decision makers of selected garment industry SMEs.	Conclusions: Contribute to the current SME related body of knowledge with the new knowledge of SCM practices of Sri Lankan garment industry SMEs.
Research Objectives (RO)	**RO2.** To explore the factors those have contributed to the implementation of successful SCM strategies by SMEs in the Sri Lankan garment exporting industry. **RO3.** To examine the barriers faced by Sri Lankan garment exporting SMEs in implementing improved SCM strategies.	**RO2.** To explore the factors those have contributed to the implementation of successful SCM strategies by SMEs in the Sri Lankan garment exporting industry. **RO3.** To examine the barriers faced by Sri Lankan garment exporting SMEs in implementing improved SCM strategies. **RO4.** To examine the success factors for an effective SCM strategy in a garment manufacturing and exporting SMEs. **RO5.** To discuss the implications of the research findings for the Sri Lankan garment industry.	**RO2.** To explore the factors those have contributed to the implementation of successful SCM strategies by SMEs in the Sri Lankan garment exporting industry. **RO3.** To examine the barriers faced by Sri Lankan garment exporting SMEs in implementing improved SCM strategies. **RO4.** To examine the success factors for an effective SCM strategy in a garment manufacturing and exporting SMEs. **RO5.** To discuss the implications of the research findings for the Sri Lankan garment industry.
Research Questions (RQ)	**RQ1.** How successfully have supply chain management strategies been implemented by SMEs in the Sri Lankan garment export industry? **RQ2.** Why do SMEs in the Sri Lankan garment export industry find it difficult to implement effective SCM strategies?	**RQ1.** How successfully have supply chain management strategies been implemented by SMEs in the Sri Lankan garment export industry? **RQ2.** Why do SMEs in the Sri Lankan garment export industry find it difficult to implement effective SCM strategies? **RQ3.** How can a garment manufacturing and exporting SME ensure the efficient functioning of an effective, successful SCM strategy?	**RQ1.** How successfully have supply chain management strategies been implemented by SMEs in the Sri Lankan garment export industry? **RQ2.** Why do SMEs in the Sri Lankan garment export industry find it difficult to implement effective SCM strategies? **RQ3.** How can a garment manufacturing and exporting SME ensure the efficient functioning of an effective, successful SCM strategy?

10

1.9 Anticipated Contributions

The contributions of this research are at least 4 fold: it aims to contribute 1) to the academic literature with new knowledge regarding how to implement SCM strategies in SMEs 2) to the SL garment industry with practical lessons derived from the research findings 3) to other emerging economies with newly created knowledge as SMEs play an important role in generating employment and earning foreign exchange especially in developing countries and 4) furthermore, to the international fashion retailers such as Marks and Spencers, Next and H&M as they are provided with an opportunity to understand how their upstream supply chain partners perform and what factors determine their performance, as they are the leading buyers of garments manufactured in Sri Lanka.

1.10   Structure of the Thesis

This chapter provided a brief introduction and contextualised the research problem as well as presented the focused area of the research. It included the background and justification of this research which led to selection of SCM strategies of the garment industry in the western province of Sri Lanka. Further it outlined the aim, objectives and strategy employed for the research.

Chapter 2 explores and synthesises the literature on the scope of this research. Chapter 2 consists of three sections: the first section presents the theories related to SCM. Only the prominent theories of SCM and how these theories are related to SMEs are explained here. The common SCM practices found in the apparel industry are also discussed. Section 2.3 outlines the theories related to SMEs. The characteristics and definitions of SMEs and failure factors of SMEs are discussed at the beginning of the section. Then the background of SMEs in Sri Lanka is explained including different definitions used by several institutions and problems and issues they face. Finally the different perspectives of SME growth and failure with special reference to the contribution made by effective SCM strategies are also discussed. Section 2.4 discusses an overview of the garment industry in Sri Lanka. The significance of the role played by garment industry in terms of economic development of Sri Lanka, its main foreign markets, the main products manufactured and industry structure are outlined here; and finally, SCM issues faced by the Sri Lankan garment industry are discussed.

The methodology for this research is then discussed in Chapter 3. This covers the theoretical justification for the selected methodology for this research along with the actual case study protocol used for this research. An overview of basic research methodologies is included together with some previous case studies have been conducted in relation to SCM practices and SMEs. The stages of data collection and data analysis procedures and research ethics are discussed in detail in this chapter.

Chapter 4 presents the findings of the research. The successful SCM strategies have been implemented and barriers faced by the companies are explained under the identified themes and patterns with the support of empirical data analysis.

Chapter 5 discusses the findings of the research in comparison to the reviewed literature and previous research findings relevant to the subject area.

Chapter 6 is the final chapter and summarises the findings of the research. The theoretical and commercial implications are discussed, and future research is suggested based on the findings of the present research.

Chapter 2. Literature Review

2.1 Introduction

This chapter reviews the literature of SCM, SMEs and the Sri Lankan garment industry, and accordingly it is organised into these three main sections respectively. The first section of this chapter focuses on the theoretical background of SCM. This section presents prominent theories of SCM, relevant to this dissertation, rather than attempting to cover all of the very large and multidisciplinary literature on SCM. Further it discusses the importance of SCM in SMEs. The concepts contained in sandcone theory and factory fitness are also explained followed by the main SCM practices that can be found in the apparel industry. Finally indicators for measuring supply chain performance are discussed towards the end of the section.

The second section of this chapter provides an overview of how SMEs contribute to the economic development of a nation; particularly the importance of SMEs in emerging economies. There is a distinct lack of literature on SMEs in developing countries and an even greater scarcity of literature on the Sri Lankan garment SME sector. However, the available literature discusses some of the common problems faced by the Sri Lankan SME sector. Further, the definitions of SMEs adopted by different multinational institutes and countries are also discussed. Finally factors aiding the growth, and hampering the performance, of SMEs are presented.

The final section provides an overview of the Sri Lankan garment industry and its importance to the nation's economy in terms of earning foreign exchange and generating employment. Further it outlines the SCM issues that exist in the industry. Although there is a considerable body of academic and policy literature on the Sri Lankan garment industry, very little has been written on SCM related aspects.

2.2 Supply Chain Management: Theoretical Background

Modern business environments face continuously growing competition. Manufacturers have been exploring advanced and sophisticated technologies to tackle such intense competition efficiently and successfully (Momme and Hvolby, 2002). At present manufacturers have to cope with the pressures born from ever-changing requirements of

customers for customised products and the demand for quality enhanced products. At the same time, to ensure profitability, they must minimise production costs, reduce the lead times and maintain lower inventory levels (Felix *et al.,* 2003). Customers are gaining an increasing importance by demanding differentiated and high quality offers (Piachaud, 2002), in the meantime complexity of the products and the technologies are improving, together with their capacities (Momme and Hvolby, 2002). Against this background it is inefficient for an individual firm to function in isolation, in terms of all the functions from product design to product delivery to the final consumer. Therefore, the majority of the manufacturing firms are motivated to build up long-term strategic partnerships with a few experienced suppliers and join with them in product development, inventory control, and non-core process outsourcing (Felix *et al.,* 2003).

Further, to achieve the general goal of improving customer satisfaction, enterprises must ensure that distribution and customer order delivery are properly coordinated. Given this environment, the paradigm of modern business management has experienced a major shift from competing as single enterprises to competing as integrated supply chains (Lambert *et al.,* 1998). Success depends on collaborating with other firm that have complementary competencies (Svenson, 2003). Therefore single entities are no longer competing independently, but as supply chains (Christopher, 1998). Positioning itself in a reliable supply chain is important to a manufacturing firm to ensure that it is pursing competitive advantage (Lim *et al.,* 2006). Supply Chain Management (SCM) and related strategies are critical for an organisation because the cost and quality of the goods and services sold directly links to the cost and quality of the goods and services purchased (Koh *et al.,* 2007).

2.2.1   *SCM in SMEs*
Implementation of SCM strategies improves a firm's competitiveness regardless of the size of the firm (Brau *et al.,* 2007). The companies can achieve market success by offering products and services valued by customers which require effective resource management. A more solid base of resources generates better economic performance of SMEs. Furthermore, innovativeness, problem solving orientation and flexibility are the other success factors of SMEs (Lin, 1998). Although the lack of resources is a common problem faced by SMEs (Marchington *et al.,* 2003; Augustyn, 2004), SCM can overcome the problems imposed by the lack of resources (Fawcett *et al.,* 2006). An SCM mind-set

14

helps managers to see beyond organisational limitations to determine how the resources of suppliers and customers can be utilised to improve the business (Dell and Fredman, 1999). Wynarczyk and Watson (2005), Fawcett *et al.* (2006) and Barclay (2005) go so far as to suggest that supply chain partnerships ensure the sustainability of the SMEs. All the activities that are not at the core of the firm's value proposition can be shifted to the other channel members who possess superior capabilities (Fawcett and Magnan, 2002). The right collaborative relationships among the channel members of the supply chain improve the performance of SMEs by leveraging the complimentary competencies found throughout the supply chain (Croom *et al.,* 2000; Brau *et al.,* 2007). Thus it changes the thought process of managers of SMEs and enhances the success of the SMEs through building up unique value propositions.

2.2.2 Theories of SCM

Being relatively a new phenomenon (Cousins, 2006), SCM is a fast-growing area of interest to both academics and business management practitioners. SCM is enriched with the theoretical aspects of marketing, economics, logistics and organisational behaviour. The different insights from these disciplines are contributing towards the understanding of how and why different supply chain management arrangements have emerged (Hobbs, 1996). The combination of several behavioural and organisational theories facilitates understanding of decision making and practices in a collaborative network of firms (Halldorsson *et al.,* 2007). Although SCM is enriched with different theories from various disciplines only the prominent theories of SCM are outlined in this section. Namely, the transaction cost approach (TCA), resource-based view (RBV), social network theory (SNT) and agency theory (AT) are discussed. While developed in disciplines not directly related to logistics, these theories are relevant to particular SCM issues and discussed under each theory with reference to SMEs as well. In a broad sense, these theories are based on organisational theories (Halldorsson *et al.,* 2007). Especially TCA and AT originate from the broad discipline of organisation economics and RBV from marketing and purchasing, and strategic management (Croom *et al.,* 2000). They further suggest that SCM is a discipline which has been contributed to by different subject literatures such as purchasing and supply, logistics and transportation, marketing, organisational behaviour, contingency theory, institutional sociology, system engineering, best practices, strategic management and economic development. Agile manufacturing (AM) and lean

manufacturing which are later discussed originate from purchasing and supply, and logistics and transportation.

a) *The Transaction Cost Approach (TCA)*

Coase (1937) posited the idea that the firms exist due to "marketing costs" which is now termed as transaction costs. He criticised the neoclassical theory; especially the assumption of that economy is directed by the price mechanism. He pointed out that this assumption is not suitable for a firm. The TCA has been developed based on four key concepts which are explained below. These four concepts have been contributed to by number of other disciplines such as psychology, political science, economic history and law.

According to TCA (Hallikas et al., 2002), the market mechanism may fail due to:

Bounded rationality Bounded rationality takes forms of neurophysiological and language limits. In uncertain or complex environments bounded rationality is predicted to cause a shift to managerial hierarchy.

Opportunism Not all actors will behave opportunistically but due to the constraints of bounded rationality and uncertainty it is difficult, if not impossible, to distinguish between those who will cooperate and those who will behave opportunistically.

Asset specificity Asset specificity considers how specialised a particular asset is to a relationship. Specialised assets are risky in that the full production value of the asset cannot be transferred if a contract or relationship prematurely terminated. A relationship with high asset specificity is theorised to increase the possibility of opportunism. As such, firms may choose to integrate the process rather than run the risk of the open market.

Uncertainty Uncertainty costs relate to environmental and behavioural costs. A firm facing a highly uncertain environment will face highly complex contractual agreements or may face high renegotiation

costs as the relationship develops. Firms face behavioural costs when the behaviour of the partner firm is uncertain.

Source: Cousins *et al.* (2008, p. 30)

Transactions costs are incurred when exchanging goods or services between firms in the market place or transferring resources between layers of a vertically integrated firm (Hobbs, 1996). According to Axelsson and Easton (1992) transaction costs are the costs of doing business with others. It may include the costs of planning, coordinating and safeguarding exchange. Hobbs (1996) divides transaction costs into three categories: information, negotiation and monitoring costs. Information costs are those that firms incur when searching for information about products, raw materials, sellers and buyers. Negotiation cost occurs when the transaction physically take place which includes the costs of negotiating, paying for intermediary services and writing contracts. Monitoring costs are those associated with the monitoring the quality of products and the behaviour of supplier or buyer to make sure that all the previously agreed conditions of the transaction are met. When the cost of these transactions is higher, the firms tend to "make" rather than "buy".

Barney and Ouchi (1986) state that the opportunistic parties in a network of supply normally tend to break agreements and make false promises for the sake of their own benefits. He further argues that organisations have limited capability of information processing so a certain amount of uncertainty is often linked with a transaction. And also identification of all possible effects of a transaction is very costly for an organisation (Williamson, 1987). Transaction-specific assets are also associated with an uncertainty so if the relationship with the supply chain partner is terminated the organisation loses the value of that particular assets. Logan (2000) points out that the higher the asset specificity the higher the transaction costs. Transaction costs are minimal if the transaction occurs smoothly without any conflict. However, organisations often fail to transfer goods and services without any conflict and these conflicts determine the transaction costs of organisations (Williamson, 1987).

Large organisations have the liberty to make the decision to in- or outsource (make or buy) but for SMEs it may be more complex (Hallikas *et al.,* 2002). When large firms find

high transactional costs in the distribution channel management process, they may integrate forward to overcome market inefficiencies (Rindfleisch and Heide, 1997).

Subject to the condition of limited resources SMEs cannot imitate large firms and therefore they have to face high transaction costs to build and maintain supply networks (Barringer, 1997). SMEs largely depend on intermediaries to contact customers as they lack resources needed undertake this task directly (Zacharakis, 1997). Due to this fact SMEs face the risk of receiving distorted or false customer information. Even intermediaries sometimes fail to pass important customer information (Majumdar and Ramaswamy, 1995). As SMEs depend highly on the intermediaries, they are exposed to possible opportunistic behaviour of the partners in the supply chain (Nooteboom, 1993). Moreover SMEs possess high quantities of information specificity as they share information with the intermediaries of the distribution channel (John and Weitz, 1988). Therefore SMEs face a higher level of uncertainty as they cannot always expect intermediaries to behave positively.

From a TCA perspective, an SME is likely to incur high transactional costs when establishing a proper distribution channel management due to its inherent nature of small size. SMEs by default lack resources and merely because of this they are subject to all the concepts (bounded rationality, opportunism, asset specificity and uncertainty) those which make the market mechanism generally fails. Hence the transaction costs of SMEs are often higher compared to that of the large firms.

b) *Resource-based View (RBV)*

The RBV accounts for how firms can be independent of opportunism. TCA perceives firms as the form of last resort (Williamson, 1999) whereas RBV believes that firms are capable of creating specific advantages that are not available in the market in the form of transactions, through the combination of specific resources (Cousin *et al.,* 2008). Madhock (1996) suggests that although potential cost of employee hold-up is higher than employee shirking, still buying may be less costly. Therefore make-buy decision depends on the comparison of new undertakings and specific current capabilities and the cost of developing new capabilities (Conner, 1991).

One important difference between neoclassical theory and RBV is that the neoclassical economists hold the view of resources and capabilities (factors of production) of a firm are elastic in supply. On the other hand the RBV recognises that many factors of production are elastic in supply while some factors of production may be inelastic in supply (Barney, 2001). RBV further argues that the resources and capabilities of a firm cannot be developed in short to medium term. Also many of the resources, like social complexity, cannot be bought or sold (Barney, 2001). The resources and capabilities of inelastic supply are capable of generating profits beyond normal profits and the supply of these resources will not be increased in the short to medium term or perhaps in the long term. Thereby the resources with supply inelasticity may become a sustained competitive advantage for a firm (Peteraf, 1993). Barney (1991) points out that for firms' resources to hold the sustainable competitive advantage they should possess four particular attributes: (a) it should be able to exploit opportunities and/or neutralises the threats, (b) it should be a resource rare among the competitors, (c) it must be imperfectly imitable and (d) there cannot be strategically equivalent replacements for these resources.

Figure 3 shows the steps a firm passes through when it is faced with a make-buy decision. As illustrated in Figure 3, decision making depends on the level of resources and capability of the firm. If the firm does not possess substantial capabilities to make the products internally, first firms look for the option of developing the required capabilities of producing the products. If this option fails the next option is to assess the potential of acquiring the capabilities of producing the products. If both of the options fail, firms must find external suppliers.

Figure 3: The RBV Approach to Make-buy Decision
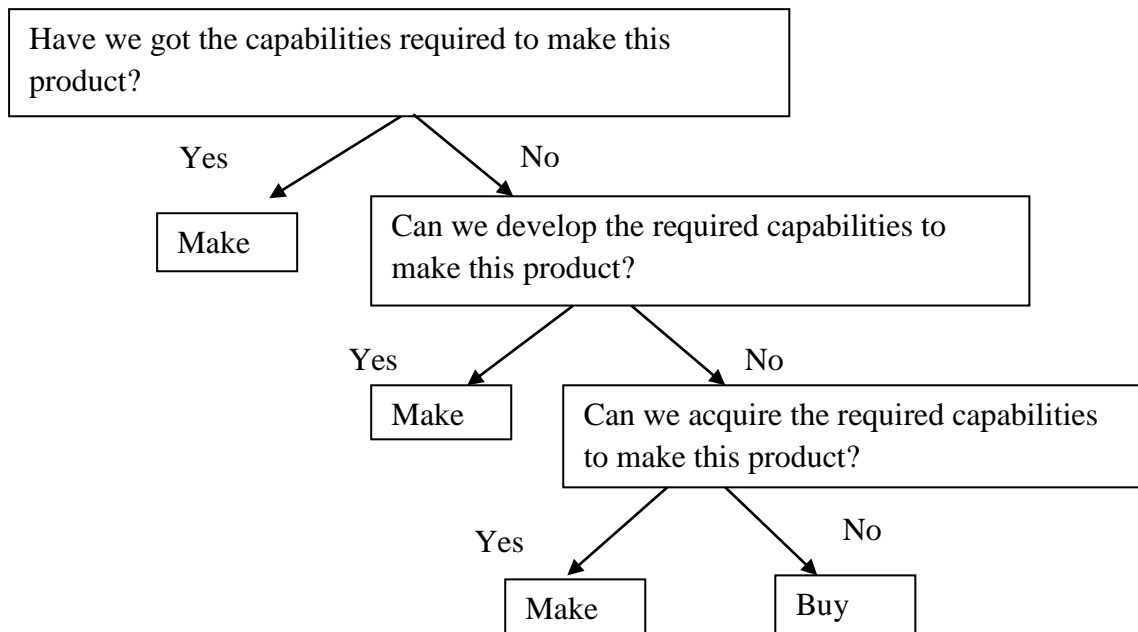
Source: Cousins *et al.* (2008, p.36)

However, there are four main reasons for why the firms cannot always develop the needed capabilities internally (Barney, 1991) as follows;

Historical Context - Creating new capabilities often incurs a cost. Therefore finding cost-effective ways to create new capabilities is required. A firm's ability to be cost-effective depends on being in the "right place at the right time". This may be not possible under all circumstances.

Path Dependence - There may be certain capabilities, which take a long time to build up. There may not be any short-circuit ways to acquire these capabilities. Hence developing the capabilities depends on the path which is a long process to create it. This is a time-consuming and costly way of creating new capabilities.

Social Complexity - There is particular capabilities which are socially complex such as firm's culture, suppliers' trustworthiness and goodwill of the firm. Although these capabilities are extremely valuable for a firm to pursue effective business and corporate strategies, creating them is costly for a firm.

Casual Ambiguity - Situations arise where it is not clear for firms which actions they should take to create particular capabilities. When the correlation between the actions and

the result is not clear it creates an ambiguity which makes difficult to decide how and which capabilities should develop.

According to Cousin *et al.* (2008), if firms identify that the required capabilities to make products are unable to develop the next option is to explore the opportunity to acquire the required capabilities. But, Barney (1991) further explains the reasons for why sometimes the acquisitions also can be costly for a firm. This may be due to the main five reasons explained below.

Legal Constraints - Acquiring the required capabilities for a firm always may not allowed by the law persist in countries. There may be certain legal restrictions on acquisitions.

Effect on the Value of Capabilities - Sometimes the expected value of the capability is reduced after the acquisition. It may be below the level of being sought.

Strategic Flexibility and Uncertainty - The dynamic nature of the market conditions may demand different nature of capabilities. Therefore it is difficult for firms to figure out the long-term requirements for success. In such a situation being flexible facilitates the acquisition after uncertainty is resolved.

Unwanted "Baggage" and Diffused Capabilities - Firms are collections of capabilities. It is often difficult to separate them from each other. When firms face acquisition, both desirable and undesirable capabilities may be acquired. Acquiring the unwanted capabilities is identified as "baggage" which increases the cost of acquisition. When the capabilities are diffused throughout the organisation it may be difficult to differentiate wanted and unwanted capabilities.

Leveraging Acquired Capabilities - Even if none of the above reasons exists, acquiring another firm still will be costly as leveraging the acquired capabilities across the relevant parts of firm is difficult.

In summary, the RBV stresses the fact that firms can secure the competitive advantages based on two concepts: resources and capabilities. Resources are tangible and intangible assets and the capabilities are the ways of achieving diverse activities depending on the availability of resources (Garant, 1994).

In the context of SMEs investing in resources and acquiring capabilities are quite complex as it has to increase the efficiency scale or size (Pil and Holweg, 2003). Sanchez and Marin (2005) argue that it is an issue whether SMEs can achieve competitive advantage through enhancing the resources and capabilities as large firms do. Large organisations most frequently develop the sustained competitive advantage based on the cost efficiencies gained through the formalised structures and the systems (Porter, 1990: Bessant and Tidd, 2007). On the contrary several studies have revealed that intangible resources and capabilities are fundamental to create competitive advantage of SMEs. Cooperation (Hoffman and Schlosser, 2001), technological resources and innovation (Hitt *et al.,* 1990), human resources (Wagar, 1998) and flexibility and organisational design (Feigenbaum and Karnani, 1991) play important roles in creating competitive advantages.

SMEs in the manufacturing sector develop competitive advantage through the creative ability of its work force and offering differentiated products for niche markets (Fuchs *et al.,* 2000). Flexibility is one of the most important assets that SMEs possess which brings the advantages of speed of response, ability to innovate and capacity to adapt (Feigenbaum and Karnani, 1991). The SME practices of subcontracting and hiring part time and temporary employees promote the characteristic of flexibility (Ruigrok *et al.,* 1999). Generally the SMEs include informal strategies (Hudson *et al.,* 2001). The formal planning of large firms is a barrier to requirements of the fast-moving and flexibility environment where as the informal nature of SMEs has been strength to its innovative potential (Terziovski, 2009).

Although SMEs lack resources, creating collaborations with customers and suppliers allows manufacturing SMEs to take advantage of the existing resources (Appiah-Adu and Singh, 1998). Such partnerships provide SMEs with new skills and enhancing present skills Terziovski, 2010). Further, O'Regan *et al.* (2005) point out that these collaborations assist SMEs with leveraging the risk. Alliances and cooperation with large firms provide the opportunity for SMEs to enjoy the advantages of being large and cost reductions and flexibility (Pil and Holweg, 2003). Cooperation is a major strategic option to SMEs as it provides the access to resources without having to merge. Therefore they still can maintain the flexibility which facilitates rapid adaptation according to the changes in the environments (Glaister and Buckley, 1996). However, limited resources may not encourage SMEs to develop collaborations with the external parties.

Organisational culture is a socially complex capability as pointed out by Barney (1991). In general SMEs are likely to have flexible cultures embedded the characteristics of low risk aversion, relatively low resistance to change and tolerance of ambiguity (Acs *et al.,* 1997). The flexible culture encourages the innovation performance of SMEs (Saleh and Wang, 1993). However, there is contradiction in the literature regarding the relationship between the formality and the innovation performance of an organisation. Some others (Prakash and Gupta, 2008; Patel, 2005) argue that formality is a key driver of inculcating the innovation ability in an SME.

Unlike large organisations, SMEs' manufacturing processes are centralised around a single breakthrough technological capacity (Qian and Li, 2003). SMEs are not in a position to embrace the technological advances as large firms do, due to the inbuilt disadvantage of lack of resources.

c) *Social Network Theory (SNT)*

The history of the SNT dates back to the 1950s when Barnes introduced the concept of the social network as an association of people drawn together by family, work or hobbies. SNT explains how networks affect the social structure of relationships around a person, group, or organisation in regard to beliefs or behaviours. In other words, a social network (SN) is any system that has as a set of interrelated actors or nodes (Borgatti and Li, 2009). The actors are the entities in a network such as persons, firms and countries. The ties are the relationships among the actors in a network. SNT focuses on the relationships among people rather than the characteristics of the people. These relationships may include the exchange of information, goods or money.

Figure 4 shows the different types of ties that are commonly seen between individuals. Basically ties are divided into two, such as continuous and discrete. The continuous ties are for a particular duration, such as a marriage. The discrete ties on the other hand are depends on the frequency of certain events happen between two people such as pieces of information transfers.

Figure 4: Types of Tie

```
                        Types of Tie
                            │
          ┌─────────────────┴─────────────────┐
          ▼                                   ▼
      Continuous                           Discrete
          │                                   │
    ┌─────┴─────┐                       ┌─────┴─────┐
    ▼           ▼                       ▼           ▼
Similarities  Social                Inter-actions  Flows
              relations
```
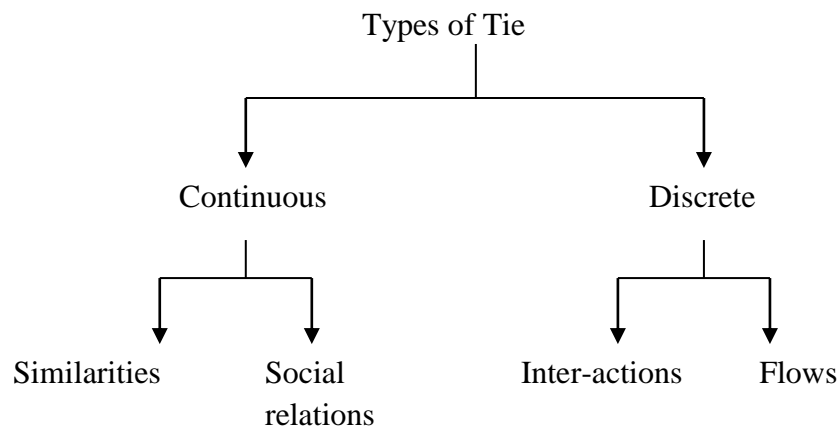
Source: Borgatti and Li (2009)

At the second level, ties are divided into four main categories of similarities, social relations, inter-actions and flows. 'Similarities groups' refers to the relationships people hold because they share a similar characteristic between them. For example, the relationship that two people have merely because they come from the same race. Firms can create joint membership in trade associations which can be treated as a relationship of 'Similarities' (Human and Provan, 2000). 'Social relations' refers to the two types of relations of continuously existing and role-based relations. Continuously existing relations are always kinship relations. The role-based relations are the relations of being a friend or boss. At the firm-level the ties of joint ventures, distribution agreements and ownerships and the competition in between are considered as the 'relations' (Powell, 1990). The relationship of 'interactions' is the number of times that a typical event happens between people. If one person sent 20 emails during a month to another person it is an 'interaction' relationship. The interaction between the firms is when one firm purchase or sale any good or service to another firm or take actions in competition with other firms in the market (Ferrier, 2001). 'Flows' are the movements of money, ideas or goods and services between the actors when they interact with each other. Therefore, 'flows' are the most important kinds of tie that are of value to organisations.

Monge and Contractor (2003) state that there is growing interest in research into why communication networks emerge, and the effects of communication networks on the organisations. The supply chain management literature also embraces the importance of

network analysis (e.g.: Choi and Kim, 2008; Borgatti and Li, 2009; Galaskiewicz, 2011). SNT is relevant for organisations as they undertake their activities together such as share information, coordinate the schedules and develop products and services (Galaskiewicz, 2011). But still developing an effective network chain has been an issue to organisations. "Getting trust" is one of the major problems in the context of SCM (Macaulay, 1963). In contrast, Powell (1990) argues that networks are faster, lighter on their feet and can move "know-how" effectively as actors in a network trust each other. Unlike the way in which SNT describes, the SCM network is broader and consists of several actors. Therefore SNT has some limitations in application of SCM as it is centred on dyad and triad relationships (Choi and Wu, 2009). SNT fails to address the complexity of the supply chains (Gereffi and Koreniewicz, 1990). As an alternative to this problem Watts (1999) structures the supply chain as a small-world network and Uzzi and Spiro (2005) further suggest that this form of organisational networks are very successful in maintaining relationships among them. Galaskiewicz (2011) claims that the two strategies of 'amalgamation' and 'decoupling' ensure trust in throughout small-world network. Amalgamation is to bring functionally interdependent actors in the network under the same cultural or normative system. This will give rise to a foundation of more generalised exchange and cohesion among the firms in the network (Molm *et al.*, 2007). Decoupling can be a strategic decision made by a firm when skipping products from one cluster to another to add value (Uzzi and Spiro, 2005).

Choi and Kim (2008) introduce the concept of structural embeddedness and argue for its importance in SCM. "When the concept of structural embeddedness, applied to supplier management, illuminates that a supplier's performance depends on how it integrates itself with its suppliers and customers" (Choi and Kim, 2008, p.5). The relationship with a buyer and supplier is a dyad relationship in terms of SNT as it links two nodes. Although it is a dyad, still the buyer and supplier are parts of their own networks. The dyad relationship between the buyer and supplier links these two broad networks and therefore identifying the relative position in this extended network is worth for an organisation. Rowley *et al.* (2000) points out that focusing on the relational structure of the network, inter-organisational exchanges and the architecture of network ties can facilitate organisational performance. Being informed of the suppliers' extended networks makes it easier the buying firms to smooth flow of information among them (Tsai, 2000).

Havnes and Senneseth (2001) argue that through networking SMEs can access the external resources that reduce some of the inherent weaknesses of being small. They argue further that a well-connected network promotes SMEs' market share. Johannisson (1996) suggest that entrepreneur utilise their personal network in the business enterprise to promote the business activities. The informal social networks and relationships are the foundation for building formal networks of business linkages (Chen, 2003). Therefore, SMEs can overcome the resource constraints through utilising the informal networks initially to build up formal networks later. Such informal social networks are considered vital for identifying market opportunities for SMEs (Ellis and Pecotish, 2001). Informal networks facilitate the internationalisation of SMEs (Zhou *et al.,* 2007; Haahti *et al.,* 2005) which in turn develop the performance of SMEs (Knight and Cavusgil, 2004). The social networks are extremely important for internationally oriented SMEs as such networks are a platform for linking the foreign markets (Ellis, 2000).

It has been found that a superior network improves the innovation of an SME. For example a firm's relationships with the government increase SMEs awareness of funding opportunities for innovations and changes of regulations (Fountain, 1998). Moreover, the networks provide the tacit knowledge needed for innovations (Cooke and Wills, 1999).

The co-operation between various institutions, networks and business partners provides a kind of insurance to the SMEs as they strengthen mutual expectations and give access to relevant information (Spence *et al.,* 2003). Since SMEs do not have sufficient funds to access professional information these informal networks is an ideal mechanism for exchanging information (Spence *et al.,* 2003).

A study by O'Donnell and Cummins (1999) summarises the importance of the networking activities of owner/managers in SMEs. They argue that the networking activities of the owner/manager of an SME used to gather information about competitors, and keep them informed of "goings-on" within the industry as a whole. Also the owner/manager usually attempts to develop strong relationships with key customers. Further the owner/manager realises the importance of networking when entering new markets and as a base for developing competitive advantages.

d) Agency Theory (AT)

Agency Theory is primarily based on the relations between two parties. One party is known as 'the principal' who requires another party to undertake actions, namely 'the agent', on the principal's behalf. This dyadic relationship ensures that the agent acts in the best interests of the principal. AT theory is built based on certain assumptions that will now be explained.

AT assumes that the principal and agent are self-interested and motivated by profit maximisation. The goals of the principal and agent are diverse and therefore they have different risk preferences (Eisenhardt, 1989). The utility maximising behaviour of the principal and agent creates the potential problem of opportunism (Fama, 1980). Eisenhardt (1989) therefore suggests that it is important to provide the agent with targeted incentives to avoid opportunism and for the agent to act according to the principal's interests.

Environmental uncertainty and information asymmetry are also assumed under AT. Environmental uncertainty refers to unexpected outcomes from a principal–agent relationship. It is partly determined by the environmental conditions of market, economic factors, the degree and strength of competition and technological conditions which are outside of the control of both principal and agent (Bergen *et al.,* 1992). Information asymmetry is the agent's reluctance to share the information with the principal born from self-motivation (Stiglitz, 2000). Information asymmetry gives rise to problems of moral hazard and adverse selection. Moral hazard is the inappropriate *ex post* behaviour of the agent which occurs due to the agent's extra exposure to some information. This extra exposure has an incentive to the agent not to behave in line with the principal's interests (Ciliberti *et al.,* 2011). In contrast, adverse selection is the inappropriate *ex ante information exchange between the* agent and the principal. In other words, the principal has selected the agent because the principle was not aware of a certain characteristic of the agent (Ciliberti *et al.,* 2011). Bergen *et al.* (1992) suggested three strategies (screening, signalling and self-selection) to overcome the problem of adverse selection which involve an extra cost to the organisation. Screening is to collect further information about the potential agent which incurs an extra cost. Sometimes the agents indicate to the principal that they possess the expected characteristics; this is considered as 'signalling'.

Self-selection is a costly strategy adopted by the principal when investing some devices to detect the false signals sent by the agents.

Agency problem is a common dilemma discussed in the literature in regard to AT (for examples, see Pratt and Zeckhauser, 1985; Williamson, 1999). The agency problem arises when configuring an agreement between a principal and an agent which includes the incentives to motivate an agent to serve the principal's interests even when the agent's behaviour is not monitored (Pratt and Zeckhauser, 1985). Gibbsons (1998) points out that the nature of the incentives provided in a principal and agent relationship determines the performance of the agent.

The application of AT is rare among the SCM research (Ciliberti *et al.,* 2011). However, Halldorsson *et al.,* (2007) stress the importance of AT in resolving the goal confliction in a supply chain. Supply chain relationships are important as information, materials and finances flows in between suppliers and customers (Brindley and Ritchie, 2004). The chain director can be considered as the principal in a supply chain and other members are the agents (Ciliberti *et al.,* 2011).

Vertical integration through mergers and acquisitions (Cooper and Gardner, 1993), joint ventures (Lambert *et al.,* 1996) and partnerships (Mentzer, 2004) are the main types of organisational relationships can be seen in the context of SCM. The formal contract is not always adequate to manage these relationships as opportunistic behaviours and mistrust would result without additional mechanisms (Norrman, 2008). Trust, commitment and information sharing are essential in relationships (Whipple *et al.,* 2010). Trust smoothes the progress of collaboration in supply chains through information and resource sharing among the supply chain members (Fawcett *et al.,* 2006). Since maximising bottom line is the prime objective of the partners of a relationship the collaborative relationships of supply chain members can be made stronger by financial and non-financial incentives (Min *et al.,* 2005).There may be further conflicting goals among the members of the supply chain as all of them might try to increase the value by reducing the cost.

Therefore the role of incentives in an agency relationship is crucial in the context of SCM as in a supply chain; members can act as both principal and agent. The goals and incentives of supply chain members are common relationships can be seen in a supply chain (Hornibrook, 2007). Figure 5 shows the principal-agent relationship within a

generic supply chain from a demand-perspective. It describes the relationship the final consumer has with the supplying firm as a principal and the subsequent influence on the different tiers of the supply chain. As it shows the members at certain tiers in the supply chain can act as both agents and principals because of the multiple dyadic relationships in a supply chain.

Figure 5: Principal-agent Relationship within a Supply Chain

Supplier Tier 2
(Agent)

Goals and Incentives

Supplier Tier 1
(Principal and Agent)

Goals and Incentives

Manufacturer/Retailer
(Principal and Agent)

Goals and Incentives

Final Consumer
(Principal)
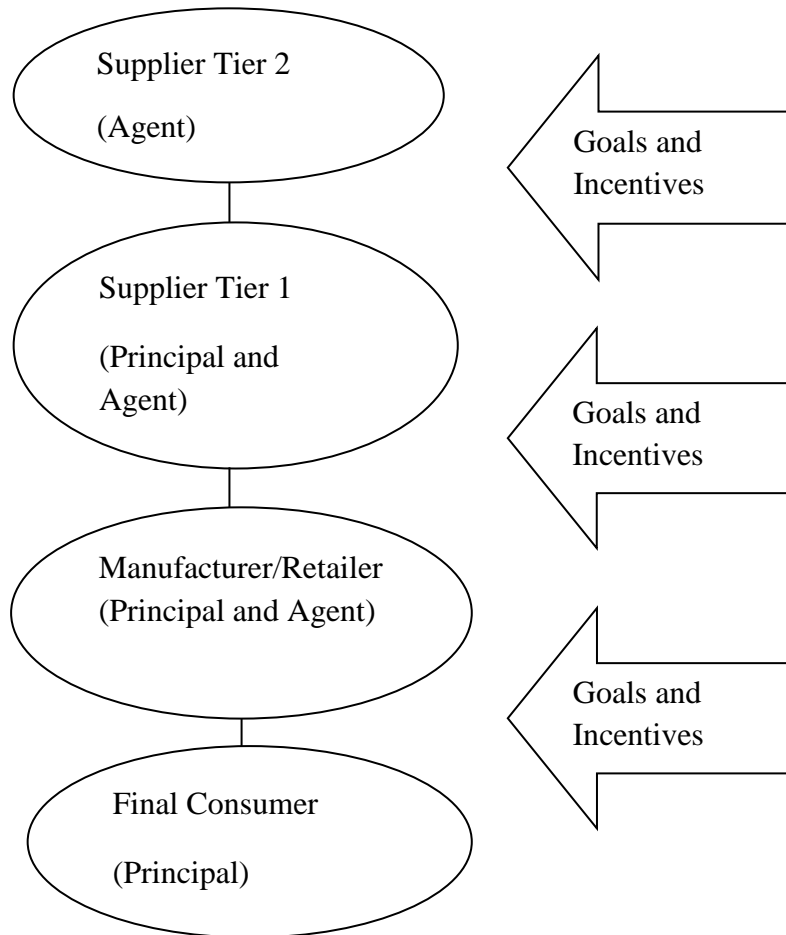
Source: Hornibrook (2007, p.14)

The ultimate result of the supply chain can be affected the external conditions such as economic and market situations. Also, information asymmetry and moral hazards among the supply chain members may cause them to over promise and underperform. In order to avoid such problems several researchers have suggested the practice of codes of conduct (for e.g. Emmelhainz and Adamas, 1999; Roberts, 2003; Salamone, 2008).

Outsourcing none core activities is a common strategy to realise cost advantages in designing supply chains (Berglund *et al.,* 1999). AT plays an important role to figure out the conflicts between the outsourcing user (principal) and outsourcing provider (agent) (Logan, 2000). Further he argues that especially when outsourcing transportation, AT can be used to build trust and initiate sustain relationships. The performance measures of transportation contracts are traditionally either outcome-based or performance-based. Poppo and Zenger (1998) state that outsourcing users are often dissatisfied with the performance based measures especially measures such as the cost. Therefore in order to maintain a better agency relationship the service providers should present additional information which will support the behaviour based measures.

Supply chains are inherited with risks stemming from the different sources. These sources include price increases, product unavailability (Steele and Court, 1996), product quality issues, unexpected changes in the volume of types of products required (Lee and Billington, 1993) and product and technological changes (Robertson and Gatignon, 1998). Eisenhardt (1989) suggests that the viewpoint of AT assists some supply risk management efforts. Supplier certification (Cox and Blackstone, 1988), process oriented quality management (Choi and Liker, 1995), target costing (Newman and Mckeller, 1995) and managing inventory (Lee and Billington, 1993) are the some of the strategies have been developed on the basis of AT (Zsidisin and Ellram, 2003).

The effect of AT is significant when the business is small (Hand *et al.,* 1982) as it faces a higher level of risk (Petti and Singer, 1985). Hutchinson (1991) discusses the importance of AT in explaining the reasons for existence of SMEs. He argues that "when economies of size are not great or agency costs are very great, small size may be the optimum" (Hutchinson, 1991, p.1). He further explains that possibility of applying AT for understanding of the various aspects of SMEs' finance structures.

Furthermore the problem of information asymmetry is higher in SMEs (Ciliberti *et al.,* 2011). Information asymmetry, moral hazards and adverse selection are the main problems in SMEs caused by agency relationships (McMahon, 2004). These problems exacerbate the conflicts between owner/manager and outsiders which may bring negative results consequently on SMEs (Easterwood and Singer, 1991). The lack of resource base causes these problems as it would be costly to monitor the agents in the supply chain

(Lepoutre and Heene, 2006). The application of code of conducts is a possible solution of overcoming the problems originated by information asymmetry (Roberts, 2003). But, it is difficult for SMEs to afford as it needs major investments (Welford and Frost, 2006). However, McMahon (2004) found that a greater enterprise growth is significantly evident in SMEs with more complex agency relationships. Ang (1991) argues that the exceptional characteristics of SMEs limit the extent of AT application in SMEs by two means:

1. In the majority of the SMEs owner and the manager is a one person. Therefore the agency relationship between the manager and owner cannot be seen in many SMEs.
2. SMEs find difficulties in investing in solutions for the agency problem, such as monitoring and bonding, as they are relatively costly.

2.2.3   Lean Manufacturing (LM)

LM originated from the Toyota Production System in Japan. LM is different from the traditional, inventory-based manufacturing techniques because it considers static, non-value-adding inventory as a waste of resources (Womack *et al.,* 1990). It was developed on the basic concept of that customers pay for only the value of the product or service they receive, but not the cost of the mistakes done during the production process. Thereby it established a basis for manufacturers to plan their operational processes in a different way, especially from a view point of maximising the value for customers (Rose *et al.,* 2011). Basically, LM is designed in a way that it eliminates the waste and the non-value adding activities in manufacturing processes (Shah and Ward, 2002). Naylor *et al.* (1999) claim the reduction of all kinds of wastes including time to establish a level schedule as the focal feature of lean. It continuously monitors the flow of production, materials and services in the process of value creation.

The concept of minimising waste was so important to the Toyota Production System that it acknowledged seven types of waste:

Waste from overproduction - Producing more than required by the customers. It exceeds the market demand and increases the level of inventory which is a waste.

Waste from transportation – Non-value adding handling and movements of the products.

31

Waste of motion - This occurs due to inappropriately located workers and machines which gives rise to unnecessary handling.

Waiting - Waiting for certain for tasks to be completed delays the flow of production. This may include the situations such as waiting until a cycle finishes, receives some information and gets feedback from supervisors.

Processing- The extra steps for processing the production increases the cost. Therefore should consider of combining possible processes to reduce the number of steps.

Inventory- Bulk production and production processes with long cycle times cause high inventories of work in progress.

Defects- Producing defective products is a gross waste of cost. Repairing defective products increases costs further. Therefore producing defective products should be avoided.

Papadopoulu and Ozbayrak (2005) argue that LM is an effective strategy of reducing the cost of production which leads firms to achieve excellence. It plays a major role in competitive markets (Bamber and Dale, 2000). The implementation of LM anticipates firms to obtain a 90% reduction in lead time, quality costs, inventories and 50% increase in labour productivity (Lathin and Mitchell, 2001). However, the implementation of LM is costly as it involves a higher level of commitment, time and a solid base of finance (Motwani, 2003).

Pavnaskar *et al.* (2003) suggest that more than one hundred lean practices exist in different industries. In order to succeed in LM, Bhasin and Burcher (2006) suggest that a firm should implement all or most of them. Shah and Ward (2002) having screened the available literature on LM, has identified 21 lean practices generally implemented by the most of companies. However, Rose *et al.* (2011) reviewed highly cited journals regarding best practices of LM and revealed 17 practices. They are defined in Table 1 below.

Table 1: Definitions of LM Common Practices

Practice	Definition	Reference
Reduced set up time	"This program would attempt to reduce the time and costs involved in changing from the tooling, layout, etc. required to produce one product to that of required producing other products. Reducing the setup times will allow for reduced economic lot sizes produced and reduced need for buffer inventories".	White *et al.,* 1999, p. 5
Kanban	"This program would attempt to eliminate the "PUSH" system of material flow and develop a "PULL" system which is dependent upon the operators at downstream workstations to initiate material movement and control the pace of material flow for upstream work stations versus the traditional management control of the initiation of material movement".	White *et al.,* 1999, p. 5
Small lot size	"Each process can produce only one piece, can convey it one at a time, and in addition, have only one piece in stock both between the equipment and the processes. This means that no process for any reason is allowed to produce extra amount and have surplus stock between the processes".	Sugimori *et al.,* 1997, p. 555
Supplier management	Close cooperation with suppliers	Lamming, 1993
Preventive maintenance	"The TPM programme is a proactive and cost-effective approach to equipment maintenance. It is an integrated process requiring the support of all levels of the organisation. It maximizes equipment effectiveness by establishing a comprehensive productive-maintenance system covering the entire life of the equipment and spanning all equipment-related fields".	Brah and Chong, 2004, p. 2383
Multifunction employees	"This program would attempt to formally cross train employees on several different machines and in several different functions".	White *et al.,* 1999, p. 5
Cell layout	A cell layout involves grouping together a number of dissimilar machines or processes according to the design of the product being made or the operations required for its production.	Bennett (*The Blackwell Encyclopaedia of Management*)
Visual control	"Visible and updated graphs and panels showing the levels being reached in quality, productivity, breakage, problems detected in the area".	Bonavia and Marin, 2006, p. 530
Employee involvement(quality circles)	"This is an employee participation program. This program would attempt to involve employees in problem solving and decision making activities. Through the use of a facilitator and extensive training, small groups of employees would meet routinely on common problems or common areas of interest and make recommendations to management. The scope of this program would also include cross-functional employee participation groups and labour management employee participation groups".	White *et al,.* 1999, p. 5
Total quality management	"This program would establish quality as the top priority of the organization's business objectives. This includes involvement in the quality effort by all functions, employees, and suppliers.	White *et al.,* 1999, p. 5

	Implementation of statistical quality control methods for defect prevention is an integral part of the program".	
Training	Train the employees to perform different tasks in order to acquire different skills.	Keller, 2001
Teamwork	"Refers to a sense of responsibility for the whole enterprise and to mutual aid and off-line improvement activities".	Dankbaar, 1997, p. 577
Kaizen (continuous improvement)	"Refers in particular to the small, incremental improvements".	Dankbaar, 1997, p. 579
5s	Five practices that improve the quality management with improved productivity. (Seiri- organisation, Seiton- neatness , Seiso- cleanliness , Seiketsu- standardisation, and Shitsuke – discipline)	Ablanedo-Rosas *et al.,* 2010
Standardisation	"Constantly updated operations sheets specifying procedures, tools and materials, and operating times".	Bonavia and Marin, 2006, p. 530
Continuous flow	"Continuous product flow all the way through value streams, from raw material to the customer".	Rother and Harris, 2001, p.1
Focused factory	"This program would attempt to reduce the complexities of the manufacturing process. This may include any or all of the following: simplifying the organizational structure, reducing the numbers of products or processes, and minimizing the complexities of physical constraints".	White *et al.,* 1999, p. 5

Prior to implementing any of the above lean practices, strategic and operational plans should be properly laid (Hayes, 2000). Management involvement and commitment play a vital role in this regard (Coronado and Antony, 2002).

Commenting on the most common lean practices of firms, Rose *et al.* (2011) suggest that according to the available literature 'set up time reduction', 'kanban' and 'lot size reductions' are the three major lean practices mostly implemented by firms. Narang (2008) highlights the importance of these three practices as they are crucial in effective LM implementation. In order to succeed with LM these practices should be implemented in combination (Liker, 2004).

Karlsson and Ahlstrom (1996) claim that SMEs can garner the benefits of LM, in a similar manner to that of large firms. But, SMEs may find it difficult to implement the majority of the LM practices due to the problems of resource availability (Gunasekaran *et al.,* 2000). SMEs tend to use the simplest and low cost LM practices (Lee, 2004) as the required finance and employee commitments are less. Moreover, having considered the publications on LM practices of SMEs, Rose *et al.* (2011) identify that, except teamwork,

all other common LM practices are found also in SMEs. However, since SMEs are run with fewer employees than large firms, working in teams is important in SMEs. LM practices of quality circles and continuous improvement are linked with teamwork and it indirectly mentions that teamwork also a common practice in SMEs (Rose *et al.,* 2011).

From the Rose *et al.*'s (2011) list, Lee (2004) suggests that 5S, quality circle, preventive maintenance and employee involvement can easily be implemented by SMEs as they need less financial investments. Further, Rothenberg and Cost (2004) argue that less costly LM practices such as Kanban and 5S are the more attractive strategies for SMEs to consider. Although the existing literature suggest that SMEs should consider implementing less costly LM practices, some researchers claim that SMEs can implement LM without any difficulty (Cua *et al.,* 2001; Bonavia and Marin, 2006). However, Achanga *et al.* (2006) conclude that leadership and management, finance, skills and expertise and the culture of the recipient organisation are the key important factors for successful LM implementation in an SME. They further argue that among these factors leadership and management commitment are the most critical.

2.2.4   Agile Manufacturing (AM)

Surviving in a turbulent business environment is a challenge for organisations as they need to understand unexpected changes and responses appropriately. This could not be possible only through changing the way manufacturers see their customers, suppliers and competitors (Preiss, 1997). It is necessary to take the changes as opportunities and adopt proactive ways to deal with customer and market demands (Sharifi and Zhang, 2001). In order to gain competitive advantage through changes in the market environments the more recent paradigm of "agility" is being widely accepted. Different authors have expressed agility in many ways. Kidd (1995) explains agility as the total integration of business components. Montgomery and Levine (1996) define it as the flexibility of manufacturing, people and the organisation. Burgess (1994) suggests that agile manufacturing is a paradigm that supersedes the old paradigm of mass manufacturing. Goldman and Nagel (1993) see agile as integrating prevailing technologies and ways of arranging production systems. Further, Christopher and Towill (2001, p. 236) describe agility as a "business-wide capability that embraces organisational structures, information systems, logistics processes and in particular, mind-sets". They highlight the importance

of flexibility of the organisation in adopting agility. The foundation for agility is Flexible Manufacturing Systems (Christopher, 2000).

The Iaccoca Institute of Leigh University developed the concept of AM in 1992 and defines it as "a manufacturing system with extraordinary capabilities (Internal capabilities: hard and soft technologies, human resources, educated management, and information) to meet the rapidly changing needs of the marketplace (speed, flexibility, customers, competitors, suppliers, infrastructure, responsiveness). AM is a system that responds quickly (speed and responsiveness) among change in product models or between product lines (Flexibility), ideally in real-time response to customer demand (customer needs and wants)" (Yusuf *et al.,* 1999, p. 36). This definition emphasises the importance of responding to customer demand promptly. But, this needs specific capabilities which are costly. Therefore it is questionable that the majority of the organisations can adopt AM.

Yusuf *et al.* (1999) acknowledge four main concepts of AM and describe the interaction of these concepts in detail. Figure 6 illustrates the core concepts and the relationship among the concepts. Core competence management, virtual enterprise, capability for reconfiguration and knowledge-driven enterprise are the key concepts. Core competence management is to enhance the core competencies of the employees through investing in training and education to meet current and potential customer demands. The core competencies of the individuals are skills, knowledge, attitude and expertise of them (Kidd, 1994). Unlike traditional enterprises, virtual enterprises reflect a higher level of co-operation at the enterprise and functional levels. It allows resources and skills to spread across the organisation which enhances the ability to respond quickly to customer requirements. Agile enterprises should be able to rearrange their business operations promptly to pursue new business opportunities as soon as they are recognised. This represents the level of capability for re-configuration in an organisation. The knowledge-driven organisations embraces knowledge, data and information as the utmost resource to facilitate differentiate from competitors. Agile enterprises should focus on improving knowledge; especially the skills and experience of the work force. These four key concepts should be integrated perfectly in order to ensure that an organisation is responding promptly to the new market opportunities and customer requirements.

Figure 6: The Core Concepts of Agility
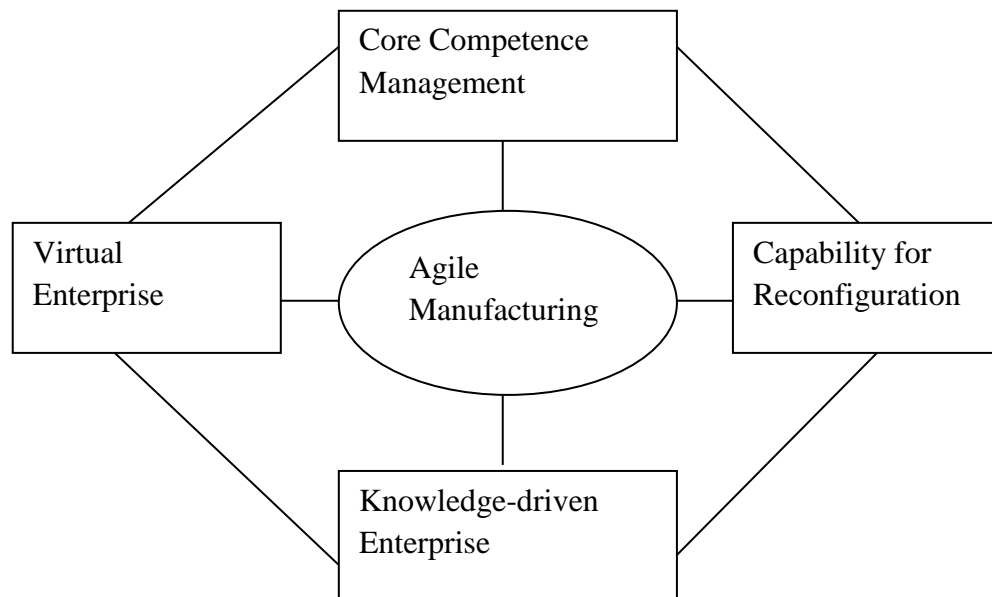
Gunasekaran (1998) highlights four basic principles of agility: delivering value to the customers; being ready for change; valuing human knowledge and skills; and forming virtual partnerships. These principles are very similar to the core concepts of agility described by Yusuf *et al.* (1999). However, Sharifi and Zhang (2001) conclude that agility can be reached in manufacturing organisations via strategic implementation of best manufacturing practices and tools. They further state that in implementation of agile strategies different organisations need different levels of changes. Therefore the combinations of best practices are unique to each organisation.

With intense market competition, SMEs find it especially difficult to survive. Agility has found to be a way of ensuring an organisation's survival in a continuously changing environment. As stated by Yusuf *et al.* (1999) one major principle in implementing agility is the virtual enterprise. A possible approach for SMEs to become virtual enterprises is to collaborate and deliver the quality, scope and scale of products which they would not have been able to do individually (Yusuf *et al.,* 1999). Camarinha-Matos and Afsarmanesh (2003) also suggests that the virtual enterprise is a good way of building up

"collaborative supply networks". However, Armoutis *et al.* (2008) argue that if SMEs plan to carry out large projects they should consider collaboration with the peers rather with suppliers. Apart from this, sub-contractors for large organisations are another approach of SMEs to form virtual enterprises. The contribution of AM is critical for the SMEs with their relatively small customer base; AM provides the best ways to compete successfully in the marketplace (Lee, 2004). Poolton *et al.* (2006) suggest that at the "crises-points" of SMEs, tools and techniques like AM would change the way they think about the future. They suggested an Agility Strategic Framework which enables SMEs to identify their own way to agility depending on their capabilities and the competition in the operating environment. The Agility Strategic Framework consists of six variables (cost, delivery, quality, performance, flexibility and innovativeness) which can be used as the base for understanding the primary drivers for the business (Poolton *et al.,* 2006). Moreover, Snowden *et al.* (2002) claim that, in preparation to implement agility; SMEs should understand their operating environment comprehensively through the changes taking place. The magnitude of the changes, impact the changes make on operations and level of control are three criteria that SMEs identify.

2.2.5   *Agile or Lean*

Christopher (2000) stressed the importance of distinguish "leanness" and agility of organisational supply chains. Although these two terms have a close relationship with each other they are two different concepts. While agility is a business-wide concept that incorporates logistics, information systems and mind sets of the people, lean is to doing more with less (Christopher, 2000). He further describes that the decision of agile or lean depends on the dimensions of "variability" and "variety" of demand conditions in the market. Figure 7 illustrates the taxonomy which guides firms to choose agile or lean suggested by Christopher (2000). According to Figure 7 lean is suitable for firms which produce high volumes in a low variety and predictable environments. Agility works with the firms which produce low volumes in highly unpredictable environments with high variety.

Figure 7: Agile or Lean
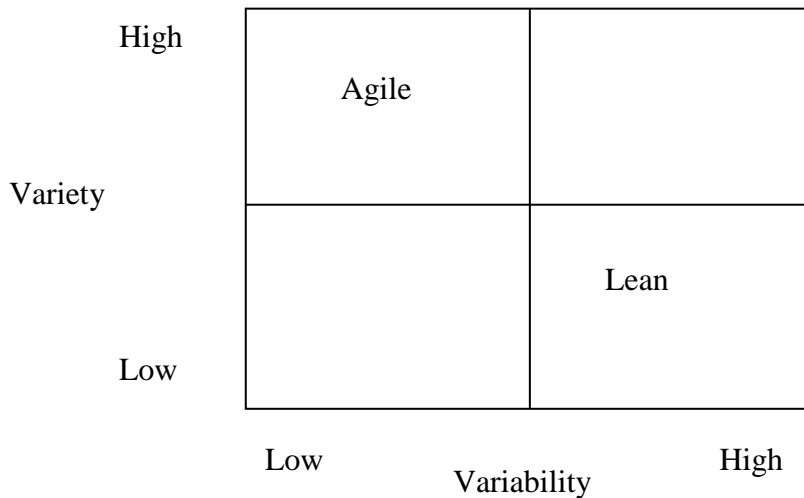
Source: Christopher (2000, p. 38)

However, Christopher and Towill (2001) showed the various ways that can be combined these two concepts together to create highly competitive supply chains. The combination of lean and agile is known as "leagile" (Mason-Jones *et al.,* 2000). The pareto curve, de-coupling point approach and separation of "surge" and "base" demands are the three approaches they suggested. The Pareto curve approach suggests that the companies who produce and distribute different types of products should differentiate the products based on the criteria of variability and variety of the market conditions such as demand. The percentage of products that are more likely to be predictable should be handled with lean manufacturing and distributing principles. Leagile assures the cost effectiveness in the upstream supply chain and high service levels in the downstream supply chain (Mason-Jones *et al.,* 2000). The products that are offered to an unpredictable market environment will require more agile supply chain.

The de-coupling point approach involves a strategic inventory. Strategic inventory is to hold some inventory in generic or modular form until the customer requirement. When the customer requirement is known final assembly is done with the strategic inventory. This concept is known as "postponement." De-coupling point is the point at which firms hold the strategic inventory or postponement is done. Firms can implement lean practices until the de-coupling point and agility beyond that and vice versa depending on the market conditions. Bowersox *et al.* (1999) identify two types of postponement related to

the time of inventory deployment and form of the product. Time-related postponement is to delay transferring of products or materials to the next location in the distribution channel until the exact order from the customer receives. In the form related postponement, the activities related to manufacturing, assembly, labelling and packaging are delayed until the customer order. Yeh and Yang (2003) point out that postponement is one of the most important strategies the garment industry firms can apply as it reduces the stock levels. Due to the unpredictability in the fashion markets better forecasts are difficult to obtain and therefore the lead time management is a better way of reducing costs in the supply chain (Christopher and Peck, 1997). However, Kumar and Arbi (2008) claim that developed country apparel industry supply chains can achieve around 26% of cost savings through outsourcing.

Separation of "surge" and "base" demands, approach depends on the nature of the demand patterns for each product category. "Base" demand can be estimated based on the past demand patterns and "surge" demand cannot. Most frequently base demand is met with lean practices to achieve economies of scale whereas surge demand requires more flexible and high cost processes. Therefore surge demand is met with agile manufacturing and distribution strategies (Christopher and Towill, 2001).

2.2.6 *Sandcone Theory*

The sandcone theory links traditional trade-offs strategy and synergy strategy. According to the traditional view, manufacturing performance is measured along five clearly distinguishable dimensions: cost, quality, dependability, flexibility and innovation (Hayes *et al.,* 1988). However manufacturers face the problem of a trade-off between these dimensions (Slack, 1991). Skinner (1969) in introducing traditional trade-off theory, highlighted the need for focused factories and suggested that management should prioritise certain manufacturing advantages following the corporate strategies and expected trade-offs.

However, with greater, global competition, this approach was increasingly questioned arose (Gagnon, 1999). Therefore synergy strategy, which is also known as 'best practice', came to the fore with the view of that firms need to develop more than one competitive priority to survive in the competitive industries (Wang and Tadisina, 2007).

Ferdows and De Meyer (1990), developing sandcone theory, do not completely avoid traditional trade-off strategy. They explain that competitive advantage is possible by building cumulative manufacturing capabilities that is built on a pre-specified sequence. The model was developed with the support of data gathered from 167 large manufacturers in Europe.

Their model is depicted as a sandcone with multiple layers and improvement programmes. There are four layers in this model (Figure 8) and the very bottom layer which is solid wet sand represents quality improvement programmes. The next layer with damp and reasonably firm sand is dependability. Speed is the layer which focuses on time reductions and sand in this layer is slightly firmer but still fine. The finest and driest sand is cost improvement programmes, which is the top layer of the sand cone. The analogy of this model is that firms should start with a solid foundation which is focusing on quality improvements first and then systems in the organisation should make more dependable products through enhancing knowledge and eliminating gaps. Focusing on time reduction should be the next layer to generate more ideas for improvement. Then only the effort on cost reduction will be realistic as the top layer of the sandcone. According to Ferdows and De Meyer (1990), the manufacturing capabilities built up in such a cumulative manner and sequence that will last longer than other alternative sequences. They further argue that the effort required to move from top to bottom of the sandcone is exponential which implies that improving cost efficiency by a certain percentage, will demand a greater percentage of quality improvement at the bottom of the sandcone.

Figure 8: Sandcone Model
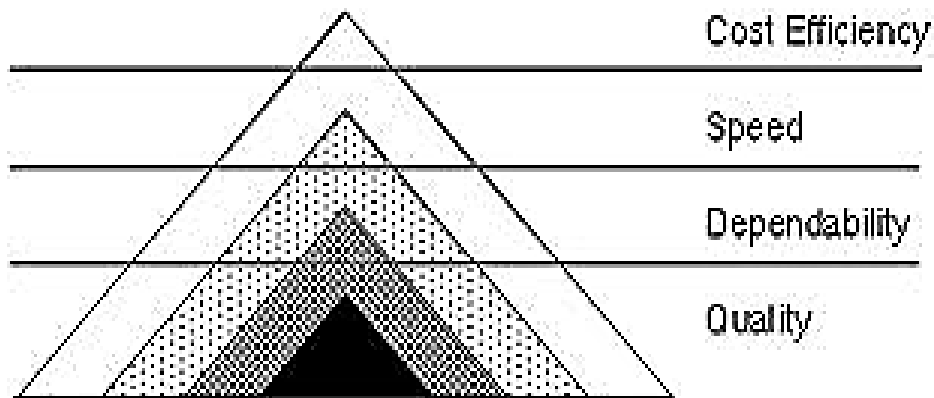
Source: Ferdows and De Meyer (1990, P. 175)

Nakane (1986) and Hall (1987) also proposed a sequence to cumulative improvements before Ferdows and De Meyer (1990) and cost is an intermediate variable in their model. Nakane (1986) proposed the sequence of quality, delivery, cost and flexibility while quality, dependable, efficiency (cost) and flexibility was suggested by Hall (1987). However in spite of these alternative models, it is the sandcone model that has gained increasing popularity (Schroeder *et al.,* 2011).

The limitation of the sandcone model is that it has not been tested with SMEs and does not consider their ability to build capabilities (Wang and Tadisina, 2007). Flexibility has been widely recognised in the literature (Spicer and Sadler-Smith, 2006: Alpkan *et al.,* 2007) as essential for dealing with turbulent market conditions. Efficiency also can be considered as a capability of SMEs and Ebben and Johnson (2005) state that SMEs that focus on efficiency or flexibility perform better than those that focus on both at the same time.

Innovation is also another potential competitive advantage for SMEs, although they have to rely highly on their networks to find missing resources (Vrande *et al.,* 2009). These capabilities of SMEs are different to those proposed in the sandcone theory and Wang and Tadisina (2007), testing the validity of sandcone model for SMEs, concluded that the strategies that fit with large firms do not necessarily apply to SMEs. They further concluded that SMEs do not strictly adhere to the sequence suggested by the sandcone model. The latter may stem from the inherent weaknesses of SMEs as a result of being small in size, namely: little bargaining power over suppliers and customers, fewer financial resources and less managerial expertise (Ebben and Johnson, 2005).

2.2.7 *Being Fit or Lean?*

Even though research has been conducted studying the importance of strategic fit and its relationship with performance (Ketokivi and Schroeder, 2004) and factors that create fit (Papke-Shields and Malhotra, 2001), a debate remains as to whether organisations can survive under changing market conditions solely by being lean or applying fit strategies. Ferdows and Thurnheer (2011) developed a model of production fitness, based on a combination of lean, agile and other manufacturing strategies. This was introduced as an extension to the sandcone model developed by Ferdows and Meyer (1990) but its focus is on building factory/production fitness. According to the model, any organisation seeking production fitness should possess three characteristics:

- Focus on simultaneous development of multiple production capabilities.
- Follow a sequence of activities whereby each activity leads to the easy implementation of the subsequent activity.
- Resource allocation is undertaken first for improving proceeding capabilities and then succeeding capabilities.

The model, depicted in Figure 9, identifies five capabilities that a factory should develop to be fitter.

Figure 9: Model for Allocation of Resources for Building Production Fitness
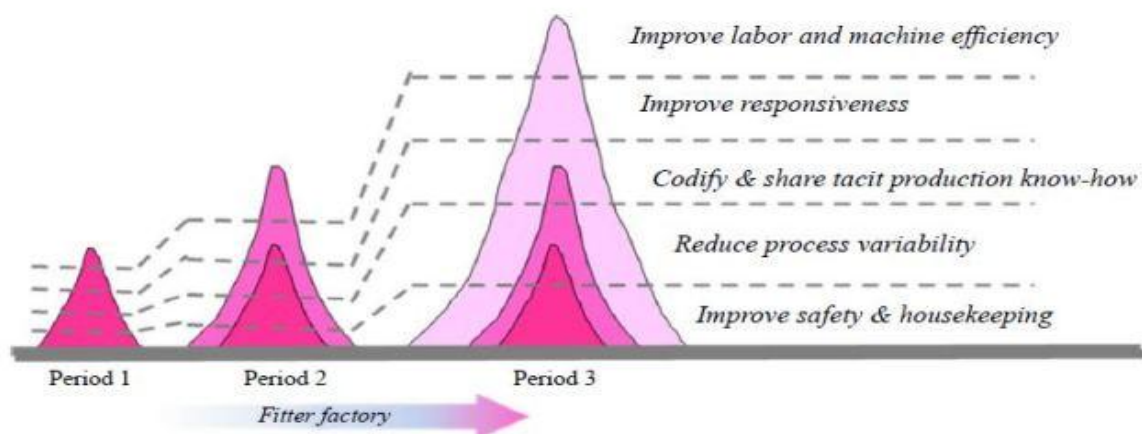
Source: Ferdows and Thurnheer (2011, p. 923)

Ferdows and Thurnheer (2011) further demonstrated that in order to be fit a factory should possess these capabilities in the following sequence:

- **Improve safety and housekeeping**: this should be done with the target of achieving zero defects and reducing unplanned production variability.

- **Reduce process variability:** this emphasises the importance of better adherence to specifications which is a constant process. Reduced variability eventually helps to codify tacit production know-how.

- **Codify and share tacit production know-how:** when tacit knowledge is codified it ensures a smooth repeatable process together with frequent improvements. This will also facilitate knowledge sharing.

- **Improve responsiveness:** when these three capabilities are developed, it makes a factory more agile with increased flexibility leading to quick manufacturing decisions.

- **Improve labour and machine efficiency:** finally improving all these capabilities will improve labour and machine efficiency to achieve higher productivity of all assets.

In conclusion Ferdows and Thurnheer (2011) suggest that with a factory fitness programme, factories are like athletics that can be strengthened by developing a prioritised set of capabilities. Hill and Cuthbertson (2011) also highlight the importance of the "internal and external" strategic fitness of organisations to achieving improved business performance.

2.2.8 Apparel Industry Supply Chains

The fashion industry is unpredictable, experiences turbulent demand (Christopher *et al.,* 2004) and is extremely diverse and heterogeneous (Bruce *et al.,* 2004). Christopher *et al.* (2004) recognise the fashion markets with characteristics of: short life-cycles, high volatility, low predictability and high impulse purchasing. They also stressed the importance of reducing the lead times (time-to-market, time-to-serve, time-to-react) by fashion industry organisations. The textiles industry as a prominent industry in the fashion industry loses a considerable percentage in revenue due to its lengthy supply chains (Lowson *et al.,* 1999; Jones 1999). Agile supply chains are relatively shorter, information-based and demand driven. Therefore with the nature of the volatility and unpredictability in the fashion industries, agile supply chains more effectively competing in the market (Harrison *et al.,* 1999).

Reducing lead times is critical in the textile industry as products stay in the market for a short time since consumer's desire novelty in designs to look different (Forza and Vinelli, 2000). Organisations that are late to the market end up with losing great sales opportunities. Hence shorter supply chains facilitate reducing lead-times in the textile industry as speed to the market is a critical factor in the fashion industry (Doyle *et al.,* 2006). Quick Response (QR) is an important supply chain strategy to implement in the textile industry (Chan and Chan, 2010). Chandra and Kumar (2000) also stress the importance of QR and accurate response as effective SCM strategies in the apparel industry. QR is an operations strategy which facilitates fast information transfer and profitable exchange of activity in an integrated mutual business network (Lowson *et al.,* 1999). Shortened lead time and decreased inventories are common features in implementation of QR. Consumers in the apparel industry demand a vast variety of and often changing clothing designs. The improved manufacturing methods of laser fabric cutting and organising the sewing machines into modular sewing cells facilitate QR in the textile manufacturing organisations (Perry and Sohal, 2000). QR leads to cost leadership and product differentiation so that QR itself can be considered as competitive advantage (Miller and Dess, 1996). However, selection of suppliers is an important decision to be taken when implementing QR (Chan and Chan, 2010). Also, the best practices of Just-in-Time (JIT), continuous improvement, lean production, flexible manufacturing systems, set-up time reduction and statistical process control enable the effective implementation of QR (Perry and Sohal, 2000). Except flexible manufacturing, other practices are defined in Section 2.2.3. Flexible manufacturing is developing flexibility in manufacturing through workers' specialisation and information technology to produce diverse range of products changing the manufacturing operations as required (Loker, 2002). JIT is a commonly implemented SCM strategy by the textile industry firms (Bruce *et al.,* 2004).

QR needs advanced manufacturing technologies of: computer aided design (CAD), computer aided manufacturing (CAM), material requirement planning (MRP) and manufacturing resources planning (MRP11) (Perry and Sohal, 2000). All of these techniques are based on improved information technology systems and they make faster the process of responding the market needs.

Radio Frequency Identification (RFID) technology also used in garment industry supply chains in collaboration with ERP to optimise material control, monitoring the production WIP progress, order tracing, storage, logistics, recording sales data and related security to improve the entire efficiency of the business process (Zymmetry Group, 2008). Adoption of RFID technology ensures improved information sharing throughout the supply chain leading to improved supply chain performance too (Pamela *et al.,* 2010). There is an increased tendency of using RFID in SCM strategies. RFID enhances the efficiency in supply chain through reduced stocks and labour costs and improved inventory management (Soon and Gutiérrez, 2002). RFID is a way of communication linking a tag and reader through the waves that capture automatic identification (Soon and Gutiérrez, 2002) so that it facilates information sharing in a supply chain.When the global apparel industry become more competitive, speed of information exchange become more critical in the multi-faceted supply chains. "Enterprise Resource Planning (ERP) is a standardized software package designed to integrate the internal value chain of an enterprise. An ERP system is based on an integrate database and consists of several modules aimed at specific business functions" (Moller, 2005, p.484). When ERP systems are implemented correctly in organisations, they can pursue the benefits of e-SCM (Burca *et al.,* 2005). Norris *et al.* (2001) also argue that if a firm does not implement ERP properly, e-SCM system may create uncontrollable upstream and downstream problems in the supply chain because of the rapid nature of information exchange facilitated by the internet. The implementation of RFID is trouble-free when ERP is already implemented. The apparel industry also can enjoy the benefits of ERP implementation: suppliers are in the receipt of information in time about the materials to be dispatched, cost savings, better customer relationships, work satisfaction, improved team work, high quality cheaper priced products and better customer service (Holland and Light, 1999). Therefore it is evident that ERP helps in reducing the lead time which is a critical factor of winning the market in the apparel industry.

Pan *et al.* (2009) suggest that apparel supply chains deal with several uncertainties such as season varieties and market changes. Further, they argue that ordering and inventory decisions are more crucial in the apparel supply chains. Due to fashion updates in the apparel industry the supply chain decisions should be as quick as possible. But the erroneousness and imperfect information may delay the supply chain decisions. In that

case, computer-based multi-agent reorder systems speed up the supply chain decisions in the apparel industry (Pan *et al.,* 2009). Moreover, Bruce *et al.* (2004) conclude that textile and apparel industry firms utilise the aspects of both lean and agile. Further they found that a combination of these two practices (leagility) is also apparent among textile and apparel industry firms. Co-Managed Inventory (CMI) is another strategy that the apparel industry firms adopt in order to reduce the transaction cost (Christopher *et al.,* 2004). CMI is "a process through which the supplier collaborates with the retailer to manage the flow of product into the customer's distribution system" (Christopher *et al.,* 2004, p. 376). The supplier restocks the inventories with the retailers based on the customer feedback data on sales.

Abernathy (2000) recommends a model that facilitates a lean management of textile and clothing supply chain. He points out that lean retailers those who are in textile and clothing supply chains should promptly refill their stocks and therefore the shipments need to be perfect in terms of strict delivery deadlines, accuracy and order completeness. Use of bar codes, EDI and shipment marking are the key means of achieving this.

Relationship management is critical in an effective supply chain management as it includes building up of partnership among the partners of supply chain (Buttle, 1996). The literature (Harland, 1997; Bowen, 2000; Wong, 1999) strongly advocates that collaborative relationships and partnerships are mutually valuable to all the parties involved in the relationship. However, Bruce *et al.* (2004) question the possibility of this and argue that it cannot be the common case in everywhere especially when a large international retailer with many international outlets dominates the supply chain being at the end of the downstream of the total supply chain. Further to this, Towers (2000), supporting the view of Bruce *et al.* (2004) states that the upstream supply chain (manufacturing sector of the industry) consists of large number of SMEs with a limited amount of power. Therefore it remains a question whether all the partnership parties in textile and clothing supply chains actually receive the benefits those they deserve. Apparel industry SMEs are vulnerable in the face of increased competition particularly due to the shortage of resource base so scheduling for shop floor control in a manufacturing environment minimises the wastage in manufacturing and supply in SMEs (Bruce *et al.,* 2004).

2.2.9 International Fashion Retailers' SCM Practices

The market characteristics of the apparel industry: short product life cycles, high volatility, low predictability and high level of impulse purchasing, emphasise the importance of shorter lead times, so that quick response has been a key issue in the industry (Carugati *et al.,* 2008). Apparel retailers that are unable to follow fashion trends underperform (Lopez and Fan, 2009). Based on this fashion companies should re-evaluate their business models and product lines to adapt to changes in customer preferences (Dunford, 2004). Fast fashion retailers can be of two types: retailers with manufacturing capabilities (Zara and Benetton) and retailers who do not manufacture their own clothes such as H&M, Mango, M&S, GAP and Next (Tokatli, 2008; 2009). The retailers such as H&M that do not possess their own manufacturing capabilities outsource the bulk of their manufacturing to Asian countries mainly due to the relatively cheaper labour found in these partially industrialised countries (Tokatli and Kizilgun, 2009). H&M work with 21 production offices that are responsible for liaising with factories in Asia and Europe (Tungate, 2005). However, in contrast Zara and Benetton possess their own manufacturing capabilities (Tokatli, 2008). Therefore, this section reviews the cases of Zara and Benetton, who pioneered advances in SCM in the apparel industry. Their strategies have been copied by others so that the cases are of industry-wide importance.

The reasons for Zara's success are vertical integration, shorter lead times, information technologies, lower quantities and more styles, policy pricing and target market (Zhang, 2008) while Benetton's success is grounded in its process, product and organisational innovation in terms of distribution strategy and acquiring complete control over the supply chain (Skjott-Larsen *et al.,* 2007). Zara and Benetton are well known cases to compare reasons for variations in lead times (Romano, 2009).

a) Benetton

Lean, agile and hybrid supply chains in the clothing industry were successfully developed and implemented by Benetton (Christopher, 2000). In 1964, Benetton invented a new process that involved delaying the dyeing of sweaters until demand was certain (Drake and Marley, 2010) which became known as postponement. However, its initial success was eroded after other fashion retailers started to imitate them and it found it difficult to adapt to the changing demands of its customers. In response it implemented a dual supply

chain model to overcome this situation (Drake and Marley, 2010). The new model enabled Benetton to achieve quick lead times ((Indu and Govind 2008). Benetton also successfully introduced mass customisation in fast fashion (Daaboul *et al.,* 2012).

Benetton was found in 1965 and is an Italian-based fashion designer. Now, it has more than 6,000 retail stores that operate in more than 83 countries. Benetton adopts a global strategy. It sells the same garments worldwide in similar small boutique-style shops. To improve consumer response, Benetton has linked logistics with their core business strategy through information systems technology (Drake and Marley, 2010). With Electronic Data Interchange (EDI), agents in different countries update head office on trends in the market. Benetton optimises communications technology to integrate the supply chain. Computer-Aided Design (CAD) in another successful strategy Benetton adopted to improve the speediness and flexibility of the manufacturing process. The key aspect of Benetton's manufacturing process is to manufacture garments from bleached yarn and postpone dyeing until the customer requirement details are presented through EDI (Romano, 2009). This strategy can be identified as a combination of both lean and agile practices as a strategic inventory is created through postponing the dyeing process (Naylor *et al.,* 1999). The design and manufacture of the garments take place in-house and garments are assembled by subcontractors. Benetton largely use SMEs for knitting and final assembly (Christopher *et al.,* 2004). When customer requirements are known via EDI, dyeing is done again in-house while subcontractors carry out final assembly. Benetton has achieved numerous cost savings through innovations in its manufacturing process (Romano, 2009).

b) *Zara*

Zara's manufacturing systems are also similar to Benetton but have been refined with lean practices developed by TPS (Christopher, 2000). Zara, founded in 1975, is a Spanish firm and subsidiary of the parent company (Inditex) and has become one of the successful fashion chains in the world (Cuc and Tripa, 2007). Inditex consists of more than one hundred firms which conduct different business activities in the textile and fashion design industry. The supply and demand chains of Zara are vertically integrated. It does not rely wholly on outsourcing, unlike the majority of fashion retailers. Ferdows *et al.* (2004) state that Zara manufactures complicated products in-house and outsource less complicated

products such as sweaters. They further found that Zara's supply chain is built on the three main principles: closing the communication loop, stick to a rhythm across the entire chain and leveraging capital assets to increase supply chain flexibility. It operates a network of more than 300 subcontractors who work exclusively for Zara (Christopher *et al.,* 2004). The business model of Zara is to "offer the latest style in a high quality product at a good price" (Cuc and Tripa, 2007, p. 2522). Zara delivers its products to the market between 12 to 15 days which is an excellent lead time compared to a norm of 60 to 90 days in a traditional fashion chain. Zara now out-performs Benetton in terms of lead times with its highly integrated and responsive supply chain network (Romano, 2009). Especially in the fashion industry with highly volatile demand for different clothing designs, shorter lead times play a significant role in gaining competitive advantage. Zara manufactures clothing in small batches which lowers the cost of inventory handling. The essence of Zara's supply chain is to minimise the lead times to bring the latest fashion to the market before its competitors. Zara is able to practice continuous innovation with limited supply (Ferdows *et al.,* 2004). By exploiting advantages of advanced information technology devices, the "trend spotters" and store managers of Zara, immediately transfer the latest trends and customer feedback to fashion designers (Tokatli, 2008). Therefore the lessons that can be learnt from Zara are: the benefits that can accrue for fashion retailers from reducing lead times rapid fulfilment (Zhang, 2008).

Table 2 compares the supply chain network structures of Benetton and Zara in terms of the structural dimensions of vertical and horizontal, geographical and relational complexity. There are far more similarities than differences.

Table 2: Supply Chain Network Structures of Benetton and Zara

Structural Dimensions	Benetton	Zara
Vertical complexity	Design, supply of raw materials, manufacturing, distribution, retail	Design, supply of raw materials, manufacturing, distribution, retail
Horizontal complexity	• Upstream network- Benetton owned main supplier and hundreds of minor suppliers • Production network-Benetton owned production sites and network of subcontractors • Downstream network- 5000 stores	• Upstream network- Zara owned main supplier and hundreds of minor suppliers • Production network- Zara owned production sites and network of subcontractors • Downstream network- 992 stores
Geographical complexity	• Suppliers, subcontractors production poles and selling points all over the world (Italy, Tunisia, Romania, Croatia, Hungary, India and china) • Selling points in 120 countries	• Suppliers, subcontractors production poles and selling points all over the world (Spain, Portugal, North Africa, Asia and Mexico) • Selling points in 63 countries
Relational complexity	• Owns the critical stages (raw materials, capital intensive production activities, retail) in the supply chain network • Externalisation of labour intensive activities to a network of subcontractors • Highly controlled retails network (wholly owned megastores and franchised stores)	• Owns the critical stages (raw materials, capital intensive production activities, retail) in the supply chain network • Externalisation of labour intensive activities to a network of subcontractors • Highly controlled retails network (Wholly owned stores, some joint ventures and franchises)

Source: Romano (2009)

Both of these companies show a high level of forward and backward integration and also a hybrid supply chain structure. More capital intensive processes like dyeing and cutting are carried out in-house while labour intensive processes are performed by a network of subcontractors. However Zara owns almost its entire total network showing a higher level of downstream integration than Benetton (Romano, 2009). Further, the business process integration of Zara and Benetton is also dissimilar. Zara uses two channels to configure its value chain while Benetton uses three and they are for different strategic priorities of different products.

2.2.10 Indicators of Successful Supply Chain Performance

The importance of shorter lead times, higher value added and strong supply chain relationships via direct contacts with buyers to achieve supply chain excellence is discussed below and these three factors were considered for this research as criteria to select the cases for the research (see Section 3.11). The context specific literature (see

Section 2.4.8) further supports that the Sri Lankan garment industry is under performing due to these factors.

a) *Lead-Time Reduction in Supply Chain*

Time based competition is gaining importance in today's business environment thus reducing lead-time is a competitive advantage (Mason-Jones and Towill, 1998). The proper coordination among supply chain partners is a key for effective supply chain performance and lead-times have serious effects on the supply chain partners' coordination (Ryu and Lee ,2003) thus lead-time reduction required a highly coordinated supply chain. Furthermore, lead-time reduction depends on the upstream and downstream operations of a supply chain (Heydari *et al.,* 2009) and lead-time reduction is therefore an investment strategy (Bookbinder and Cakanyildirim, 1999).

Lead-time is one of the key parameters that can be used to evaluate the performance of the supply chain as it reflects all phases of manufacturing and delivery operations systems (Krajewski and Ritzman, 2002). Lead-time reductions can reduce the cost of manufacturing operations as it lead-times impact on almost every cost of an organisation's operations (Hari *et al.,* 2012). Reducing lead-times can bring the benefits of accurate forecasts, lower safety stocks and lower levels of out-of-stock items and smaller order sizes which lead to reduce finished goods inventory levels (Leng and Parlar, 2009). Leng and Parlar (2009) studied lead-time reduction in a two-level supply chain with three lead-time components of setup, production and shipping lead-times. Gunasekaran et *al.* (2004) discuss order lead-time as the time between the receipt of an order and the delivery of the goods which is also known as total order cycle time and it includes order entry time, order planning time, order sourcing, assembly and follow up time and finished goods delivery time. This research is focused on order lead-time thus it does not include the component of shipping lead-time, which is included in the analysis of Leng and Parlar (2009). The chosen case studies for this research retail little control over organising shipments as this is largely directed by foreign buyers, so shipping time was discounted for the purpose of this research.

Reduced lead-time is an indicator of a properly integrated supply chain (Choi and Chow, 2008), leading to reduced supply chain response time (Gunasekaran *et al.,* 2004). Reduced lead-times are one of the benefits SMEs can achieve through effective

implementation of supply chain management practices (Koh et *al.,* 2007). Lean manufacturing is focused on minimising waste which can be anything other than what is required: equipment, materials, parts, space and working time (Rose *et al.,* 2011) so it essentially covers minimising order planning time, order sourcing, assembly and follow up time. Table 1 (see Section 2.2.3) explains the best lean manufacturing practices as suggested by Rose *et al.* (2011) and Rothenburg and Cost (2004) Cell layout (Rose *et al.,* 2011) and reducing machine/tool set up time (Rose *et al.,* 2011: Gunasekaran *et al.,* 2004) are also recommended lean practices for SMEs to achieve shorter lead-times. Close cooperation with suppliers is another lean practice that can be implemented by SMEs with their fewer resources (Papadopoulu and Ozbayrak, 2005; Treville *et al.,* 2004). The work cell concept should be implemented by both shop floor and office employees which leads to reduced lead-times (Suri, 1998). Preventive maintenance is also a low cost lean manufacturing practice that can be implemented by SMEs (Lee, 2004).

Reduced order lead-times are possible through cross-functional teams with multi-skilled employees (Schonberger, 1990). Team work saves time due to the co-ordinated approach to work rate and task completion in garment manufacturing plants (Hamilton *et al.,* 2003). Minimising paperwork in business communication also leads to reduced lead-times (Treville *et al.,* 2004).

The lower the tiers in a supply chain, the higher the responsiveness (Doyle et al., 2003) thus shorter supply chains expedite problem solving and information flow in supply chains leading to shorter lead-times. Furthermore, shorter supply chains reduce inventory investment (Treville *et al.,* 2004). However the supply chain in the textile industry is comparatively long and complex with many parties involved (Jones, 2002).

Flexibility is the capability of firms to respond successfully to uncertainties arising in the market place and production process (Candace *et al.,* 2011). Manufacturing flexibility is critical in today's business environment (Oke, 2005). Managing uncertainties can be facilitated by improved information management in the supply chain through the advanced information management techniques of ERP and MRP (Candace *et al.,* 2011). Back scheduling manufacturing operations from the expected date of delivery is also an effective method of improving manufacturing flexibility in responding to external market conditions (Bruce et al., 2004). Scheduling techniques such as JIT, MRP and ERP

effectively reduce the time taken to make decisions in the supply chain due to their accuracy and effectiveness (Gunasekaran *et al.,* 2004) and thus contribute to achieve shorter lead-times and higher value added. Effective information management is vitally important for compressing lead-times (Mason-Jones and Towill, 1998). QR is an important supply chain strategy especially in the fashion industry which facilitates a highly responsive supply chain (Chan and Chan, 2010) and advanced information management is essential to achieve this. Investment in CAD, CAM and ICT is a must to implement QR and they serve to shorten lead-times (Bruce *et al.,* 2004). Supplier selection is also a critical factor to consider as improper supplier selection will result in delays in the production (Rose *et al.,* 2011). Therefore suppliers should be evaluated based on quality, reliability and delivery performance (Treville *et al.,* 2004).

Unpredictable demands due to fashion trends and seasonality is a common and challenging uncertainty in the textile and clothing industry (Candace *et al.,* 2011) leading to higher costs and lower profits. Flexible relationships between manufacturers and suppliers can improve profits via mutual understanding (Avittathur and Swamidas, 2007).

b) *Value Added along Supply Chain*

Handfield and Nichols (2002) claim that supply chains are value generating as they connect a series of organisations, resources and knowledge streams involved in the creation and delivery of value to the consumer. They further suggest that value creation along a supply chain is in itself a sustainable competitive advantage. Simchi-Leive *et al.* (2003) view supply chains as an efficient organisation of value adding partners. Value added is the difference between the cost of inputs and value of outputs (Hines, 2004). Value added along the supply chain can be tangible (Baxter and Matear, 2004) and/or intangible (Rylat, 2003). Intellectual capital (experience, information or knowledge resources of supply chain partners) and relational capital (collaborative, business and knowledge enhancing relationships among supply chain members) are important intangible value added supply chain resources (Clements and Price, 2007). Porter (1985) described the generic value adding activities of an organisation; primary activities: inbound logistics, production, outbound logistics, sales, marketing, service, maintenance and support activities: procurement, research and development, human resource management and firm infrastructure. Flexibility in supply chains is the extent to which a system can accommodate volume and schedule changes from suppliers, manufacturers

and customers (Beamon, 1999). Supply chain flexibility is an important intangible asset as explained by Rylat (2003) and it is an important factor for improving the overall efficiency of a supply chain (Beamon, 1999). Flexibility can improve the value creation in a supply chain (Candace *et al.,* 2011). Flexibility takes different forms of volume flexibility, mixed flexibility, delivery flexibility and new product flexibility (Beamon, 1999). Being flexible interms of the integration of product and process design decisions between buyers and suppliers enables a firm's ability to innovate (Petersen et *al.,* 2005).

Lean manufacturing is focused on eliminating waste so it results in improving value added (Rose *et al.,* 2011). The best lean management practices are listed in Table 1 (see Section 2.2.3) they reduce the cost of manufacturing, improving the value added of the products.

Scheduling for shop floor control is vital in the textile and clothing industry as it can reduce resource wastage, especially with small scale companies (Bruce *et al.,* 2004). A proper shop floor control system also leads to improving understanding on value adding and non-value adding activities in a shop floor environment (Gunasekaran and Lyu, 1997). JIT is also associated with lean manufacturing as it focuses on maintaining a minimum inventory level, and thereby eliminates waste and improves cash flow, thus higher value addition is achieved (Stratton and Warburton, 2003).

Smaller inventories associated with JIT system improve quality thus higher value is added (Gunasekaran and Lyu, 1997). JIT is also a measure of flexibility (Gunasekaran *et al.,* 2004; Perry and Sohal, 2000). Lower defective rates and minimum rework are characteristics of lean SCM that eliminate waste, as well as time taken (Naylor et al., 1999). Effective cell layout and reduced machine/tool set up time practices are important for scheduling shop floor control in the manufacturing process, thus shorter product development times and improved quality levels are realistic and achievable (Spann et al., 1999). The scheduling techniques of ERP and MRP can reduce through-put time and improve efficiency in purchasing functions (Gunasekaran et al., 2001; Gunasekaran et al., 2004) by which lead-time can also be minimised while creating added value.

Cross-functional teams with multi-skilled workers effectively reduce staff redundancies (Schonberger, 1990), therebyo a greater human productivity can be achieved as well as add value to the final products (Gunasekaran *et al.,* 2004). Furthermore, as suggested by

(Gunasekaran *et al.,* 2004) a productive worker force reduces product development cycle time, thus high value added is feasible through improved product quality. Higher quality products are also possible via reliable suppliers, in terms of the standards of raw materials (Monczka *et al.,* 1998). Reliability tests should be carried out to choose trustworthy suppliers so that the quality of products and services offered by them remains at a higher standard (Jiang *et al.,* 2010). Achieving a high quality product at the lowest possible cost, better efficiency and productivity improve the performance of an organisation (Quesada et al., 2012). Reliable suppliers can effectively be integrated into new product development thus increasing the organisations' ability to innovate and create value (Petersen *et al.,* 2005).

Knowledge of the customer order path is an intangible value added stream that can add value to the tangible products (Rylatt, 2003). A complete understanding of the customer order pathway helps to avoid non-value adding activities in the supply chain (Gunasekaran *et al.,* 2004). Duplicate inventories and repetitive handling of products add unnecessary cost, without any value added to the products (Brewer and Speh, 2000). A company's ability to identify and remove bottlenecks in the manufacturing process also improves efficiency (Mehta, 2009).

Delivery channel and vehicle scheduling are important factors to consider in achieving efficiency of any distribution mode (Gunasekarn *et al.,* 2001). Reviewing total distribution cost and identifying what percentage is the information processing cost is essential as the majority of logistics cost is spent on transportation (Griffin, 1996), and lower the transport cost higher the value creation in the supply chain (Hummels, 2007). The efficiency of a supply chain can be assessed through total logistic cost of a firm, therefore a firm's understanding of the structure of its own logistics cost (i.e. information processing cost, transport cost and new product development cost) largely contributes to improve supply chain efficiency (Gunasekaran *et al.,* 2004). Higher range of products does not contribute to create a higher value added per employee, so firms should focus on a narrow range of products to improve the quality of outputs (Mapes *et al.,* 1997).

Scheduling techniques of ERP and MRP improve efficiency in purchasing functions (Gunasekaran *et al.,* 2001; Gunasekaran *et al.,* 2004), contributing to the value added in the supply chain. Electronic data exchange (EDI) also enhances value creation by

enabling improved flexibility of supply chain by customising information for individual supply chain partners (Cai *et al.,* 2006). Therefore the potential value of real time information processing and ability to access vast amount of information facilitates quick response (Jonsson and Glunnarsson, 2005).

c) *Direct and Indirect Relationships with Retail Buyers*

Proper coordination of activities with suppliers and understanding of customers' needs helps firms achieve their goals through better supply chain relationships (Quesada *et al.,* 2012). Strategic alliances with suppliers and buyers allows information sharing, risk sharing, obtaining mutual benefits and coordinating plans that can be beneficial for both parties (Hines, 2004). However, strategic alliances do not always generate anticipated benefits.

Although formal collaborations may improve supply chain performance (Kampstra *et al.,* 2006), informal relationships in a supply chain also influence supply chain performance (Ogulin *et al.,* 2012). Kampstra *et al.* (2006) further state that the efficiency of informal relationships in a supply chain is subject to the trust, power, knowledge and level of risk existing in a supply chain network.

Information transmission through the supply chain is extremely important especially in international business as production networks are spread across the world (Cristea and Oregon, 2011). Cristea and Oregon (2011) discussed the importance of face-to face business interactions between buyers and sellers in international trade and concluded that it results in higher export sales. However cooperation also brings potential risks and in agency theory these relate to the problems of information asymmetry and environmental uncertainty (discussed in Section 2.4.2).

Buyers-sellers in international trade requires a closer communication to exchange valuable business information, therefore direct relationships with buyers is desirable (Cristea and Oregon, 2011), and information asymmetry of agency relationships means that working with agents (indirect relationships) obstructs the free flow of information along a supply chain. Lasch and Janker (2005) suggest that a company's ability to identify the correct relationships or alliances between buyers and suppliers especially in a global market is paramount in improved supply chain performance in international trade. Intermediaries expect to gain profits from their inclusion in a supply chain so buyers, if

possible, are likely to avoid intermediary services and build up direct relationships (Astashkina, 2012). Although in the apparel industry, the relationship between intermediaries and fashion retailers can be cooperative, the relationship between intermediaries and small scale manufacturers tends to be adversarial (Masson *et al.,* 2007). The intermediaries in the apparel global supply chain adapt three relationship approaches (Chen and Fung, 2013, p. 310) to deal with their buyers and suppliers.

- Maintain some dependence with suppliers and customers and some flexibility upstream.
- Maintain high dependence with suppliers and customers. Compensate for low flexibility upstream with the firm's own flexible responses.
- Maintain low dependence with suppliers and customers

These relationships show that some intermediary firms in the apparel global supply chain create dependency with their suppliers and buyers to minimise the risk of the suppliers selling direct to the customers. This has an adverse effect on suppliers leading to lower profits which again suggest the importance of direct relationships with buyers.

Trust is an important factor for improved supply chain relationships (Kampstra *et al.*, 2006) and opportunistic behaviour of supply chain partners decreases trust which will negatively affect the intention to continue the relationship (Jena *et al.,* 2011). Business relationships based on formal contracts are also exposed to opportunistic behaviour by supply chain partners and mistrust in relationships (Norrman, 2008) therefore establishing a mutual understanding among the supply chain partners is critical in a supply chain ((Doyle *et al.,* 2006). However, contract management is used as a means of successful risk management between supply chain members and building trust and improving flexibility (Kam *et al.,* 2011).

The level of assistance given by supply chain partners to each other in problem solving is an indicator of the strength of supply chain relationships (Gunasekaran *et al.,* 2004). Improved information sharing (Toni *et al.,* 1994) and mutual assistance in problem solving (Maloni and Benton, 1997) are realistic outcomes of supply chain partnerships. Improved information flow in the supply chain leads to increased commitment, trust and dependence (Chen and Fung, 2013).

Jena *et al.* (2011) discussed that trust plays a key role in buyer-supplier relationships and concluded that trust defines and mediates the positive relationship between trust and the relationship continuity intention of buyers; it also mediates the influence that opportunistic behaviour can have on relationship continuity intention of buyers'.

Improved relationships with buyers sand suppliers are crucial for a business to grow together (Bruce *et al.,* 2004). The success or failure of a supply chain is determined by the level of commitment, trust and cooperation of its members (Theodorakioglu et al., 2006). They further explain that objectives of a supply chain are realistic when joint problem solving, information sharing, trust and commitment are present. The higher the level of information available in a supply chain, the higher its performance through effective problem solving (Cantor and Macdonald, 2009). Relationship specific investments tend to create high switching costs from one supplier/ or buyer to another, therefore dependence on the same buyer/supplier leads to strong business relationships (Jena *et al.,* 2011).

2.3 An Overview of Small and Medium Sized Enterprises

SMEs play a substantial role in both developing and developed countries, as they are equally involved in manufacturing and the services sectors. They represent over 90% of the all manufacturing enterprises globally (Wijewardena *et al.,* 2008). SMEs create a huge opportunity for employments in every economy. Verheugen (2008) emphasises that the importance of SMEs in the European economy cannot be underestimated and more than 23 million SMEs contribute to the economic stability. More than 100 million Europeans are employed in the SME sector (The European money and Finance Forum, 2008). SMEs in the USA, account for more than 50% of the GDP and three out of every four jobs is from the SME sector (Underwood, 2004). SMEs also account for the largest category of exporters in the USA economy (USITC, 2010).

2.3.1   Characteristics and Definitions of SMEs

SMEs are different from large organisations for several reasons. Principally, they are reactive to their external operating environments and have a fire-fighting way of thinking. Further to this, informal strategies, resource limitations and flexible structures are some other common characteristics which can be seen among the SMEs (Qian and Li, 2003). SMEs rarely share common factors because they are so varied and numerous (Burns, 1996). Generally, the growth of SMEs is incremental and slow whereas the large firms'

growth is steady (Bridge *et al.,* 1998). Storey (1993) states that, compared to large organisations, SMEs have limited product ranges. They tend to target niche markets and they have the ability to survive in the fluctuating demand conditions from the markets (Storey, 1994). Smallbone and North (1996) suggest that the first few years of an SME's life are critical since a significant number of firms do not survive during the first three years period. However, simultaneously some existing firms are growing, while some other firms are contracting in size. The failure factors of SMEs from a SCM perspective is further discussed in Section 2.3.2.

Having said this, it is difficult to find a universal definition of an SME. In various countries, different criteria are used to define this type of organisation. This is mainly because the choice of SME definition depends on various factors such as population size of the country, nature of the industry, level of international economic integration and business culture (Kushnir, 2010). Gibson and Vaart (2008, p.4) suggest four questions when setting out to define an SME. The four questions are:

1. Where do large firms come from?
2. How does a country best diversify its economy?
3. Which groups of businesses, by size and degree of development, have the greatest incentive to insist on policy reforms and accountable, transparent government?
4. What, in its essence, is an SME?

After in-depth scrutiny of existing definitions of SMEs and based on the above four question Gibson and Vaart (2008, p. 18) proposed the following formula for defining SMEs:

"An SME is a formal enterprise with annual turnover, in U.S. dollar terms, of between 10 and 1000 times the *mean* per capita gross national income, at *purchasing power parity,* of the country in which it operates."

When defining an SME, Gibson and Vaart (2008) have considered large-sized firms, a county's economic composition and the most important groups of businesses in an economy. Annual turnover is an ideal tool to measure the contribution of SMEs to Gross Domestic Production (GDP) of an economy. But in practice it is extremely difficult to

obtain data on annual turnover of SMEs because, unlike large organisations, they are not required by law to formally report their financial positions. Especially in the context of developing countries, lack of data in the SME sector is a common problem.

Table 3 presents how the EU and USA have considered employment as a key feature to determine the size of an enterprise. As can be seen from the table, the EU has several employment limitations to identify separately the micro, small, medium and large organizations whereas USA consider only one employment limitation to differentiate all the micro, small and medium sized enterprises from large organizations.

Table 3: EU and USA Definitions of Enterprise Size by the Employment

Country/ Region	Micro	Small	Medium	Large
European Union	0-9	10-49	50-249	250>
United Kingdom	0-9	10-49	50-249	250>
USA			<500	500>

Source: University of Strathclyde (2011)

2.3.2 *Factors leading to the failure of SMEs*

Compared to large organisations, SMEs tend to have a lower success rates. Reiss (2006) states that less than 50% of SMEs survive for more than five years. The same trend was observed in Australia, Japan, United Kingdom, Taiwan and Hong Kong (Lu and Beamish, 2001). Given that the majority of the SMEs are unsuccessful in the medium to long term in both developed and developing countries, it is meaningful to identify the causes behind the trend of poor performance and failure.

The failure of the SMEs is one of the topics that has discussed extensively in the field of SMEs. Theng and Boon (1996) suggest that this importance comes to the SME field due to the high failure rate found in the SMEs. They furthermore argue that it is important to identify the failure factors of local SMEs since it is suggested that a considerable percentage of SMEs fail within first five years of operation. Storey (1994) argues that without a comprehensive understanding of the major problems and the barriers face by the SMEs, no proper policy can be formulated to develop SMEs. SME literature identifies a large number of failure factors: the lack of effective supply chain management strategies is one of the prominent failure factors along with some other factors. The most

important factors are now outlined. Most interestingly all of the outlined failure factors adversely affect the function of an effective supply chain.

a) Lack of Supply Chain Management Strategies

A properly integrated supply chain is an advantage for its individual firms when faced with increased competition in the market. As a result, instead of the enterprise–enterprise competition the chain–chain competition has become prominent; although the former still exists particularly in emerging countries (Koh *et al.,* 2006). However, occasionally the empirical evidence supports the fact that SMEs invest in SCM to obtain the benefits. When compared with LEs, SMEs in general exhibit a lesser number of cooperating suppliers and customers (Hall *et al.,* 2004).

SMEs regularly experience difficulties in achieving economies-of-scale, the purchase of inputs like equipment, raw materials, finance and consulting services and therefore they do not have a broad choice of advantages and environment (Calinipar, 2007). Generally they avoid making alliances with large and more capable suppliers (Donk and Vaart, 2005). Moreover the SMEs are unable capture the market opportunities that need large production quantities, homogenous standards and regular supplies (Vaart and Donk, 2006). Quayle (2003) identified barriers SMEs face in implementing an effective SCM strategy: overcoming traditional practices, insufficient knowledge of SCM, lack of time and resources and the need for external support.

Relations, networks and collaborations are the key determinants of enhanced performance of an organization (Franco and Haase, 2009). Higher levels of networking result in improved organisational performance (Lechner and Dowling, 2003). Relations, networks and collaborations are integral parts of an effective supply chain strategy. However, due to the size of the firms, owner-centred management, lack of resources and lack of quality of human capital SMEs are unable to reach the benefits of the proper development and maintenance of business relationships.

b) Liquidity Constraints

Storey (1994) identifies that sourcing equity and debt financing are two main barriers to success that SMEs face. SMEs in general, lack finance which imposes severe restrictions on their development (Kumar and Subrahmanya, 2010). Financial capital is needed to

acquire other resources and also it is the most common form of financial resources. Therefore lack of financial resources hinders the development of SMEs (Dollinger, 1999). The implementation of a supply chain strategy requires resources. The financial resources are significant among them. The lack of finance prevents SMEs from investing in new technologies, innovations and so on. As such, SMEs are less likely to invest in SCM information systems and therefore ascertain the associated benefits (Levy *et al.,* 2002).

c) *Lack of Innovative Capacity*

The survival and performance of an enterprise depend largely on the capability of distinctive abilities which lead to the development of competitive advantage (Barney, 1991). Therefore, for the success and growth of SMEs, they should enhance the innovative abilities in the era of global competition. Innovativeness of a firm has been identified as one of the main factors to improve the performance of a firm (Desphande *et al.,* 1993; Edwards and Delbridge, 2001; Han *et al.,* 1998; Yam *et al.,* 2004). But, the lack of a skilled work force and technical know-how, market uncertainty, and financial risk of investment in innovation has reduced the level of innovation of SMEs (Kumar and Subrahmanya, 2010). However, there is an inconsistency with this argument. Both Damanpour (1992) and Fuchs *et al*. (2000) have reported that the SMEs, especially in the manufacturing sector develop their competitive advantage through the creative skills of their employees in the organisation. This is supported from a RBV theory point of view as well: the creative ability of employees is a valuable intangible asset for SMEs. In contrast large firms acquire the market with the competitive advantage of low cost gained through formalised structures and systems (Benner and Tushman, 2003; Bessant and Tidd, 2007). However, the innovative capacity of a firm is a decisive factor in innovation of supply chain strategies. The evidence from literature show that large firms rely more on internal factors such as R&D and technological capabilities while SMEs highly depend on external links with suppliers and customers for innovations (Yin and Zuscovitch, 1998; Lee, 1995). This stresses the importance of formally-maintained collaborations and networks for an SME. However the lack of innovative capacity is a barrier to initiate effective supply chains for SMEs.

d) *Lack of Quality of Human Resources*

Human resources are one of the key performance success factors of any organisation, irrespective of size. Apart from the financial assets, a qualified human resource with tacit

knowledge has proved to be one of the key success factors of survival of an organisation (Teece, 1998). The deficiencies of management can be found in SMEs due to poorly-qualified managers and their lack of experience (Bruderl and Preisendorfer, 2000). In contrast, Jennings and Beaver (1997) emphasize that strategic management in SMEs is unique and it should not be compared with professional management in larger organisations. However, the lack of quality human resource is a main barrier to develop successful supply chains as it requires a skilled staff with expert knowledge of supply chain innovations.

e) Lack of Institutional Support

Lack of institutional support along with excessive regulations is another factor which affects SME development. Many SMEs consider that the bureaucratic process that they have to adhere with and the inadequate services are prohibitive of organisational development. Furthermore, the negligence of SMEs by policy makers is another major factor to SMEs failure (Franco and Haase, 2009). Gallup (2007) stresses that around 50% of SMEs in the EU believe themselves as functioning in an over-regulated environment which is a major business constraint. On top of that, generally the SMEs are sceptical of outside help (Ghobadian and Galler, 1996). Nevertheless, the lack of institutional support and leadership negatively affect implementation of an effective supply chain. Since SCM is a collaborative effort employee's lack of interest may have a direct impact to adopt principles of SCM in an SME.

f) Lack of Formality

SMEs put great effort into coping with competition in the international market (Terziovski, 2010). SMEs have failed to develop strategies to compete with international firms successfully, because SMEs need to formalise their structures and systems (Bessant and Tidd, 2007). Prakash and Gupta (2008) also suggest that SMEs should formalise their systems and structures in order to enhance the competitiveness. Wheelen and Hunger (1998) argue that SMEs fail principally due to informal strategic planning process and lack of systems to monitor the performance. But in contrast, some authors argue that SMEs do not need to formalise the systems and structures, since flexible structures have become a competitive advantage over large firms (Narayanan, 2001; Qian and Li, 2003). Generally SMEs target niche markets with a lower range of products and therefore they do not need to formalise their systems and procedures (Terziovski, 2010). A serious

weakness with these arguments, however, is that formality and the flexibility are two different concepts: flexibility can be maintained with formality. Large organisations are also flexible at times when they make important strategic decisions because flexibility is needed to response turbulent conditions from business environment (Avison *et al*., 1995). Flexibility depends on the size of the firm and the environment that it operates.

Although flexibility enables the competitive advantage of an SME, the initiation and maintenance of an effective supply chain requires formal mechanisms, systems, planning and control. Therefore, the lack of formality of SMEs is another barrier to implement successful supply chains.

On the other hand, few writers identify the failure factors of SMEs broadly as internal and external factors. Storey (1994) argues that SMEs could fail due to external or internal factors and the relative significance of the factors will depend on the characteristics of the firm. Zacharakis (1997) also identifies that SME failure can be due to a combination of external and internal factors such as internal resources, market competition, laws and regulations and business networks and partnerships.

2.3.3 *Importance of SMEs in Developing-economies*

SMEs have gained increasingly in importance during last few decades in terms of generating employment and upgrading the performance of the economies. SMEs play a particularly significant role in developing countries. The importance and contribution of SMEs in achieving the macroeconomic goals of developing economies are significant. Policy makers in developing countries have realised that support for SMEs is vital as SMEs contribute to the national and international growth.

The majority of developing countries' SMEs are urged to become globally competitive in order to reduce the risk of exposure (Mesquita and Lazzarini, 2008). But, these firms are subjected to the inherent failure factors of SMEs (discussed in Section 2.3.2). Poor infrastructure and intuitional settings are common in developing country economies (Hoskisson *et al.,* 2000).

As a result of recognising the importance of SMEs in developing countries and the barriers they face, international and national aid agencies often fund SMEs. In 2003 the World Bank approved US$1.3 billion in assisting SMEs (Beck *et al.,* 2005). Audretsch and Keilbach (2004) identify the SMEs as an important determinant of economic growth. Beck *et al.* (2005) argue that the SME sector brings social benefits that stem from creating competition and is therefore more productive than larger firms. The role of SMEs is extremely important for developing countries as they contribute largely in generating employment and earning foreign exchange than large firms (Gibson and Vaart, 2008). Therefore, SMEs are considered as a remedy for many economic problems in developing countries including unemployment, poverty and low economic growth. Narain (2003) states that the contribution of SMEs is momentous in the emerging economies of Asia as 80-90% of industries are SMEs and they create 50-80% of total employment in the countries. Shridhar (2006) also identifies the importance of SMEs as a main source of accelerating growth of national economies.

2.3.4   SME Sector in Sri Lanka

Two categories of Sri Lankan enterprises are identified as 'formal' and 'informal' based on their legal background, whether they are 'registered' or 'unregistered' and 'organised' or 'unorganised' (Narayana, 2006). The enterprises in the informal sector are considered as those initiated and maintained with inadequate capital and often do not practice the formal financial mechanisms. These firms frequently face the difficulty of operating subject to the limited infrastructure facilities. Informal-sector firms often manufacture low-cost, low-quality, labour-intensive products. Sandaratne (2002) describes the Sri Lankan informal sector as those individuals or groups engaged as self-employed in labour services, trade, crafts, home-based enterprises employing only family labour or a small group of persons producing items such as garments. Some of the developing countries consider the informal sector enterprises as not complying with the law and do not support them. But the Sri Lankan informal sector enjoys the cooperation of the Sri Lankan government, because it plays a key role in employment, income generation and social and economic development. Especially in the rural areas, the traditional informal sector businesses (arts and crafts, jewellery, handloom, textiles and coconut and rubber-based activities) are more prominent. However, the relative significance of SMEs in the national economy cannot be underestimated due to the paucity of information.

In the past years, Sri Lanka has undergone an extensive range of economic reforms; the major reform took place in 1977 when the World Bank and the International Monetary Fund assisted the Structural Adjustment Programmes (SAP) and the stabilisation programmes with the aim of facilitating the economic growth. These programmes included conditional financial support for the SME sector. These reforms improved the country's monetary policy, financial sector reforms, government budget, poverty alleviation and human resource development. The Sri Lankan policy-makers strongly believe that government intervention is required to boost the economic growth and therefore the country needs to adopt a mixed economy model. Since 1990, successive governments have taken the initiative to intervene in the policy agenda of the country. However, one question that needs to be asked is whether SMEs have benefitted sufficiently from successive governments' economic reforms and associated policies. Therefore there is a need for developing Sri Lankan SMEs in particular as they face the problems that are characteristics of the sector (as outlined in Section 2.3.2).

In 2002, through the SME Development Programme, the Sri Lankan government acknowledged that government intervention was needed in the development of SMEs given the problems and the challenges SMEs face. The poverty reduction strategy by the International Monetary Fund (IMF, 2002) argues that government intervention is essential in an economy like Sri Lanka in order to enhance the standard of living of the people since a quarter of the population live below the poverty line. The IMF Poverty Reduction Strategy (2002) especially focuses on the employment creation in the rural sector. In Sri Lanka more employment opportunities are found around the city of Colombo[1] as the majority of firms are concentrated in the Western Province. Therefore the poverty elevation programme has targeted the rural areas in particular. Apart from the western and central provinces, the other seven provinces experience poverty and high unemployment rates (Tilakaratne, 2006) Like in other developing nations, poverty and unemployment are the major problems confronting the Sri Lankan economy. The privatisation of government-owned organisations in the textile, mining, sugar refineries, tyre and cement industries, cost thousands of jobs (Joshi, 2000). This exacerbated the unemployment problem. Therefore the development of SMEs could support the creation of employment

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[1]Colombo is the capital and largest city in Sri Lanka and situated in the Western Province.

opportunities especially in rural areas as a solution of reducing the poverty. Also, it will enhance the contribution to the GDP, embark on innovations and stimulate other economic activities. The rationalisation for the development of the Sri Lankan SME sector is not only due to the factors of employment generation and poverty elevation, but due to its multi-faceted merits. Compared to the larger firms, the SME sector has an enormous potential to create more social benefits to the economy. SMEs require relatively less capital and infrastructure than the large firms. For example, a survey conducted by the Department of Census and Statistics (2006) revealed that average investment per employee in a small enterprise is US$90, medium enterprise US$309 and large enterprise US$606. Therefore, as SMEs require less capital than large firms, invest on SMEs can be considered as a solution for the lack of capital which is a major obstacle in Sri Lanka to encourage entrepreneurs.

Many of the Sri Lankan SMEs function as sub-contractors to the large enterprises. Thus, SMEs bridge the formal and the informal sectors of the country. Therefore, the development of the SME sector in turn enhances the overall economic growth of Sri Lanka. Furthermore, SMEs create a platform to nurture the entrepreneurial skills and talents of the employees. More often, the SME sector employees lack necessary skills however the environment provides an excellent opportunity for them to train on the job.

2.3.5   *The Characteristics and Definition of Sri Lankan SMEs*

Like all other countries, Sri Lanka also does not have a nationwide acknowledged definition for small and medium enterprises (SME Development Programme, 2002). For example in the Sri Lankan context, SMEs have been defined in terms of value of fixed assets, the size of employment or a combination of the two. Different institutions define SMEs on different bases. The Industrial Development Board (IDB) defines the SMEs as those with a capital investment of less than Rs.4 Million[2] (Central Bank Report, 2005). The Department of Small Industries defines the SMEs as those with a capital investment of less than Rs. 5 Million, and which employ less than 100 employees (Central Bank Report, 2005). On the other hand, the National Development Bank defines SMEs as those with a capital investment of less than Rs. 20 Million excluding land and buildings (National Development Bank, 2007). The Export Development Board (EDB) defines

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[2]LKR 1 is equal to approximately US$ 0.009

SMEs as those with a capital investment of less than Rs. 20 Million in plant, machinery and equipment excluding land and buildings and an annual export turnover not exceeding Rs. 40 million and total annual turnover not exceeding Rs. 100 million (EDB, 2006). However, these definitions do not provide a clear basis on which to distinguish small and medium sized enterprises.

The World Bank defines the Sri Lankan SMEs by employment: enterprises with less than 49 employees are small; with 50-99 employees are medium and with more than 100 employees are large firms (Ponnamperuma, 2000). The SME Development Programme (2002) identifies the common definitions for SMEs in Sri Lanka in terms of the number of employees: small is 5-29 employees while medium is 30-149 employees. The Department of Census and Statistics has defined an SME as an organisation with 5-149 employees (Census of Industry, 2006). Table 4 presents these definitions more precisely.

The Sri Lanka Chamber of Garment Exporters which acts as the representative body of the Sri Lankan garment industry SME sector defines SMEs as those between Rs. 100,000-250,000 million annual turnover and 100-250 employees. For the purpose of this research the definition adapted by the Sri Lanka Chamber of Garment Exporters is adopted as the research is specifically focus on the garment industry SMEs.

Table 4: Definitions of SMEs in Sri Lanka

Source	Definition
Industrial Development Board (IDB)	Those with a capital investment of less than Rs. 4 Million[3] and less than 50 employees.
Department of Small Industries	Those with a capital investment of less than Rs. 5 Million, and which employ less than 50 employees.
National Development Bank	Those with a capital investment of less than Rs. 20 Million excluding land and buildings.
Export Development Board (EDB)	Those with a capital investment of less than Rs. 20 Million in plant, machinery and equipment excluding land and buildings and an annual export turnover not exceeding Rs. 40 Million and total annual turnover not exceeding Rs. 100 million.
Department of Census and Statistics	Small enterprise with 5-29 and medium with 30- 149 employees.
World Bank	Small enterprise- less than 49 employees, medium enterprise- with 50-99 employees.
SME Development Programme	Small enterprise with 5-29 employees, medium enterprise with 30-149 employees.
Tertiary and Vocational Education Commission (TVEC)	Small enterprise with 0-100 employees, medium enterprise with 101-500 employees.
Sri Lanka Chamber of Garment Exporters	Enterprises within the range of Rs. 100– 250 million annual turnovers and between 100- 250 employees.

Sources: Adapted from Central Bank Report (2005) and SME Development Programme (2002)

However, according to the Industrial Survey conducted by the Department of Census and Statistics (2006), 131,176 formally registered industrial units exist in Sri Lanka. Those units have employed around 1,050,469 people. Table 5 shows the employment and the percentage of employment of those industrial units according to the size of the establishments. The survey was based on the Department of Census and Statistics definition of SMEs and thus considered only the formally registered industries units in the country. However, the actual number of small businesses must be more than this in terms of both the number and percentage. As can be seen from Table 5, the number of small establishments is larger than that of medium and large industries. As a percentage it is 92.57%. Again it is presented a reason for developing SMEs.

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[3]LKR 1 is equal to approximately US$ 0.009

Table 5: Number of Establishments and Employment

Employment Size Class	Establishments		Persons Engaged	
	No.	%	No.	%
Small Scale (5-29 employees)	121426	92.57	285623	27.19
Medium and Large Scale (30 or more employees)	9961	7.43	747828	72.81
Total	131176	100.00	1050469	100.00

Source: Department of Census and Statistics, Census of Industry (Final Report), (2006).

Table 6 shows the results of the survey conducted by the Department of Census and Statistics (2006) that shows an alternative perspective. According to this work, 121,906 small manufacturing firms and 1,043 medium size manufacturing firms exist in Sri Lanka. There were 98% small and 0.84% medium size firms operate their manufacturing business activities in Sri Lanka. Hence, the small and medium scale manufacturing firms consists of 122,949 (98.84%) firms in Sri Lanka.

Table 6: Manufacturing Firms in Sri Lanka

Division	Between Employees 1-49		Between Employees 50-99		100 and more Employees		Total	
	No.	%	No.	%	No.	%	No.	%
Manufacturing	121,906	98	1,043	0.84	1,402	1.13	124,351	100

Source: Department of Census and Statistics, (2006)

Although the Sri Lankan SME sector is prominent in employment and revenue generation, it is still a disorganized and informal segment of the Sri Lankan economy, similar to that of most developing countries such as India, Pakistan and Bangladesh. Bandaranayke and Fernando (1989) stated that the unavailability of timely and reliable data is the crucial problem in carrying out research on SMEs in Sri Lanka. This kind of situation exists in the Sri Lankan SME sector, owing to disorganised and informal characteristics prevailing in this sector. SME Sector Development Programme (2002) points out that SMEs cover broad areas of economic activity such as agriculture, mining, manufacturing, construction and service and service sector establishments. SMEs encompass agriculture, manufacturing and service sector establishments but reliable data are available only for the manufacturing sector. Within the manufacturing sector, SMEs

account for 96% of industrial units (Central Bank of Sri Lanka, 2005). Therefore, it is difficult to state the exact number of small business units in Sri Lanka due to the aforementioned reason.

2.3.6 Common Problems in Sri Lankan SMEs

According to the Department of Census and statistics (2003/2004) annual closure rate of Sri Lankan manufacturing SMEs is 17% and the failure rate within first five years is around 65%. Wijewardena *et al.* (2000) also pointed out that the success of manufacturing enterprises in Sri Lanka is constrained by various obstacles. Bandaranayke and Fernando (1989) stated that the SME sector is a subject of curiosity for industry and business in general and many factors obstruct the growth and successful performance of the SME sector. The SME Sector Development Programme (2002) discusses that several surveys have been undertaken to investigate the problems SMEs face. The Central Bank of Sri Lanka (2007) states that inadequate capital, inadequate institutional credit facilities, usage of outdated technology, improper accounting techniques, inadequate sales promotion competencies and inattentiveness of the small businesses are the main problems faced by SMEs in Sri Lanka. Bandaranayke and Fernando (1989) pointed out that inadequate management education, low levels of technology, uncoordinated policy, shortcomings in project formulation skills on the part of SME investors, inadequate development of entrepreneurs, shortcomings in marketing skills on the part of small industrialists, and shortcomings in the World Bank funded SME loan scheme operation are the main problems for the SME sector.

On the other hand, SME Sector Development Programme (2002) suggests policy inertia, high interest rates and the emphasis on collaterals, low level of technology, absence of technical and managerial skills, lack of market information and marketing skills, lack of adequate infrastructure, current labour legislation, competition from low priced sub-standard goods and the regulatory role of the government are the problems faced by the SME sector. Wijewardena *et al.* (2000) also discussed 13 constraints, which are barriers to the success of manufacturing SMEs in Sri Lanka. Further, the tax burden, high interest rates of loans, lack of bank loans and other facilities are perceived to be more severe obstacles for SMEs than large firms. Gamage (2003) stated that the shortage of capital, management skills, obsolete or inappropriate technology, lack of SME policies and

institutional support to protect SMEs are the major problems in the Sri Lankan SME sector. Karunanayake (1999) suggests that the high cost of finance is another problem faced by Sri Lankan SME sector. The Sri Lankan SME sector also faces the challenges coming from the intense competition from the countries of India, Singapore, China and other East Asian countries with the introduction of the Open Economy Policy in 1977.

Although SMEs play a significant role in the economic development of Sri Lanka, none of the past studies on Sri Lankan SMEs have focused on SCM issues faced by them. Hence, there is a strong need to strengthen their level of implementation of effective SCM practices.

2.3.7   Perspectives of SME Growth

As SMEs play a significant role in both developed and developing nations, knowledge of important theoretical perspectives in the SME growth literature leads to an understanding of the relationships between failure factors of the SMEs and the growth of the SMEs. Past literature has presented different perspectives about the determinants of the growth of the SMEs (Birley and Westhead, 1994; Cooper *et al.,* 1994; Fuller and Moran, 2001; Davidson and Honig, 2003). Following are the prominent perspectives of the SME growth suggested in the existing literature.

a)   SCM and SME Growth

SCM is a set of functions to integrate suppliers, manufacturers, distributors and customers in order to ensure the long term performance of the firms. An effective supply chain enhances the performance of the individual firms (Chopra and Meindl, 2001). Arend and Wisner (2004) extensively discussed the relationship between SCM and SMEs. Further they stress the benefits SMEs can realise through SCM, such as high quality of the products, lower cost, higher customer service and reduced risk. Corbet *et al*. (1999) described the benefits of SCM as increased market share, inventory reductions, improved delivery service, improved quality and shorter product development. Further to this, Grove (1998) highlighted the benefits of implementing an effective supply chain: increased competitiveness for all customers, implementation of medium/long-term planning actions, increase profitability, design excellence and improved supplier self-understanding can be achieved through a smooth functioning of a better SCM. Koh *et al.*

(2007) identified the fact that the implementation of effective SCM practices has a direct impact on increasing the operational performance of SMEs. Hong and Jeong (2006) examined the impacts SMEs have on supply chain implementation through serving the roles of suppliers, distributors, producers and customers. SMEs need an overall, properly-integrated decision making system in terms of a coordinated strategic supply chain positioning to ensure they maintain competitive advantage and survive competent in worldwide competition (Lim *et al.,* 2006). At present sub-contracting has been the widely used SCM practice in SMEs (Bayraktar *et al.,* 2009). Williams (2006) explained the possibility of smaller organisations gaining competitive advantage by the execution of an improved SCM. Bhutta *et al.,* (2007) explored the SCM practices in Pakistan SMEs and showed that the firms with good SCM practices were 'more successful' than the firms that did not have good SCM practices.

b) *Entrepreneurship and SME growth*

Holcombe (1998) suggest that entrepreneurship is the vehicle of economic growth. The concept of entrepreneurship has been subject to various issues and challenges in attempts to reach an agreed definition (Kobia and Sikalieh, 2010). To a few people, the two terms of entrepreneurship and enterprise are identical, while for others, they are rather different. Coulter (2001, p.110), defines entrepreneurship for those to whom the terms are similar, as "The process of whereby an individual or a group of individuals use organised efforts and means to pursue opportunities to create value and grow by fulfilling wants and needs through innovation and uniqueness, no matter what resources are currently controlled." Wiklund (1999) found that an SME's entrepreneurial capability determines its growth. Miller (1983) suggests that undertaking risk, product and market innovation, being proactive and surviving with the competition are the main features of an entrepreneurial firm. Accordingly entrepreneurship fosters the strategic orientation, decision making styles and business practices of an organisation. However, the majority of SMEs have difficulty in investing in marketing, design and innovative activities due to their limited financial resources, time, confidence and experience (Carson, 1985). Zahra and Covin (1995) discuss the importance of being proactive in decision making; proactive firms can control and dominate distribution channels and build brand recognition. In today's business environment, product and business model cycles do not stay longer in the market (Hamel, 2000). Therefore a firm's survival in such a competitive environment largely

depends on the innovative capacity of the entrepreneurs. Entrepreneurship is an essential skill to manage a business successfully. Furthermore, improved entrepreneurial capacity facilitates innovation of an effective supply chain through the capturing and exploiting of new business opportunities.

c) The Environment and SME Growth

A number of studies assess the impact of environmental factors of the growth of the SMEs (Acs and Audretsch, 1990). Baldwin and Gellaty (2003) suggest that SME growth depends on the industry growth rate and market maturity. The dimensions of SMEs task environment such as heterogeneity, turbulence, competition and customer structure influence on the growth of the SMEs (Covin and Covin, 1990). Furthermore the opportunities for the growth of SMEs arise from the macro environmental forces of social, economic, political and technological changes (Wiklund *et al.,* 2007). Lumpkin and Dess (1996) suggest that the relationship between the SME growth and the entrepreneurial orientation characterises by the external environmental conditions. However, the management of SMEs should be able to cope with these environmental challenges. Therefore management should attempt to build up a proper strategic fit between the organisational objectives and the strategies. Supply chains are networks of companies, and this makes supply chain management challenging with regard to environmental and social dimensions (Kortelainen, 2008). Therefore a comprehensive understanding of external business environmental conditions contributes to an effective implementation of a supply chain; it especially leads to the acquisition of accurate forecasts.

d) Resources and SME Growth

Alvarez and Busenitz (2001) emphasise the importance of resources controlled by a firm and their effect of the growth of the firm; this is because of the dynamic capabilities of the resources create market change (Eisenhardt and Martin, 2000). The dynamic capabilities of resources are essentially their ability to perform different tasks. They can be integrated, gained, released and reconfigured. These different processes of resources are very important for SMEs to build, ascertain and exploit new business opportunities (Zahra *et al.,* 2006). The management of a firm should be able to integrate the resources in a way that fosters the creativity of the employees, research and development activities.

The employees should be provided with sufficient financial physical resources which will enhance the innovative capacity and in turn the organisation's entrepreneurial orientation (Wiklund *et al*., 2007). Therefore Davidsson (2004) argues whether it is the resource capabilities or entrepreneurial orientation that creates new business opportunities and a firms' growth.

Difficulties arise, however, when an SME attempts to expand its business with new opportunities. As recognised in Section 2.3.2, SMEs have a limited resources base and have limited access to financial resources which restricts the growth capacity of the business (Hartarska and Gonzalez-Vega, 2006). In terms of the dynamic capabilities of the resources, financial resources are included to a greater extent as they can be converted into other types of resources easily. The access to more financial capital facilitates the growth of SMEs (Bamford *et al*., 1997).

The firms with higher quality human capital achieve excellent performance levels (Becker, 1975). Human capital refers to the knowledge, experience and skills that assist the growth of an organisation (Wiklund *et al.,* 2007). The human capital enhances the entrepreneurial capacities of finding new business opportunities and innovation in the organisation. Chandler and Hanks (1994) suggest that human resources play an important role in determining the effectiveness of total resources of an SME.

Network resources are highly important to ensure an effectively operating supply chain that fosters the growth of SMEs. Network resources relate to the ability of the SMEs to generate alliances with other organisations, ability of the owner to build up relationships with the employees of the organisation and the interpersonal relationships of the SME owner. Baum *et al.* (2012) suggest that inter-organisational relationships of SMEs largely affect the growth of the SMEs. Ensley *et al*. (2002) found that the relationships the SME owner has with other employees of the firms immensely contribute to the growth of the young ventures. The interpersonal networks the SME owner possesses enhance the access to information about new opportunities, advice and capital which reduces the cost of resources (Jahannisson, 1996).

Overall, the availability of all the types of resources (financial, skilled human resource, network resources) improves the firm's capability of developing successful supply chain models for their own companies.

e) Growth Attitude and SME Growth

Although an SME is presented with a solid base of resources, if the SME managers do not hold favourable attitudes towards the growth of the business, it sets boundaries to the growth that it will achieve. Davidsson *et al.* (2002) suggest that growth is an "acquired taste" and not all the SME owners have such a taste or ambition. It depends on the SME managers' goals to grow the business (Wiklund and Shephard, 2003). Growth refers to the radical changes to the features of an organisation (Wiklund *et al.*, 2007). The SMEs that have undergone a process of growth may possess favourable attitudes towards the phenomenon. Previous studies on growth and attitudes suggest that there is a positive relationship between attitudes towards growth and the growth of the business (for example, Wiklund and Shepherd, 2003, Minner *et al.*, 1994). Nevertheless, it has been found that if the SME manager does not respond positively to the changes brought by the growth process, the growth process will no longer exist. A successful manager should foresee the challenges of the organisation and develop strategies accordingly, including supply chain.

However, SME growth cannot be expected with one or two perspectives explained. It is a result of a combination of all the perspectives. An improvement in one perspective may not necessarily affect another perspective as they are largely interdependent on each other. For example, having growth attitude would not alone be successful without required resources. Moreover, the all explained growth perspectives are directly or indirectly linked to the context of SCM. While the available literature provides evidence on the importance of SCM in SME growth, the other identified SME growth perspectives also largely contribute an innovation and implementation of an effective SCM strategy. Therefore, it is evident through the extinct literature that SCM plays a crucial role in the development of SMEs.

2.4 An overview of Sri Lankan Garment Industry

The garment industry in Sri Lanka was developed in the 1960s and mainly focused on the domestic market. The export-orientation of ready-made garments manufacturing started

in the 1970s. It was developed rapidly after 1977 from the introduction of Open Economic Policy which promoted production for the export market. The government encouraged exporting through the various incentive programmes such as subsidies and duty rebate schemes, lower corporate taxes, tax holidays and duty free imports of machinery and raw material (Tilakaratne, 2006). Further, free trade zones were established around the country. The harbour was upgraded with required infrastructure facilities. Banking facilities and some other advisory services were provided by the government to promote exports. The Board of Investment (BOI) was established principally with the view of providing advisory services to exporters. In 2002 the Sri Lankan garment industry's contribution to Gross Domestic Product (GDP) reached 60% and to that of industrial production over 39%. In the late 1980s tea was the main export and accounted for 48.5% of total exports. In 1990 it had come down to 26%. During the period of 1980-1990 the contribution to GDP of garments increased from 3.6% to 32.8 (Tilakaratne, 2006) which indicates the rapid expansion of the industry.

In the early years of the garment industry Foreign Direct Investment (FDI) was the main source of financing capital, but domestic capital subsequently played an important role in the industry's development. With the introduction of the Multi Fibre Agreement (MFA) in 1974, a quota market[4] came in to operation. The quota system secured foreign markets in the USA, EU and Canada for Sri Lanka. East Asian countries such as Korea, Taiwan and Hong Kong were attracted because their quotas in these foreign markets already had been utilised whereas Sri Lanka had unexhausted quotas by that time (Tilakaratne, 2006). This was an encouraging factor for Taiwan, Hong Kong and Korea to invest in Sri Lankan Garment Industry. The relatively educated and easily trainable workforce was another factor to the foreign investors to enter Sri Lankan garment industry. Later on the number of local establishments also increased with the support of government incentive programmes (Tilakaratne, 2006).

Table 7 shows the distribution of various garment industries by the ownership and size of firms as found by the Ministry of Industries. As shown in the table, the majority of firms are owned by Sri Lankans, but they are small and medium sized. The remaining firms

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[4] Quota Market: Garment trade was conducted according to the quota negotiation with MFA

which are joint ventures or foreign firms are owned by wholly or jointly by foreigners. They account for a more than 50% of total garments exports (Kelegama and Foley, 1999). That indicates that the majority of the firms are small and medium sized enterprises (SMEs) and they are yet to be developed to be competitive in the market.

Table 7: Ownership of the Garment Industries

Size of the Firm	Ownership	Percentage
Small and Medium	Sri Lankan	74
Medium and Large	Foreign	13
Large	Joint	13

Source: Central Bank of Sri Lanka (2007)

In 1992, the Board of Investment (BOI) was established with the aim of promoting exports and developed different incentive programmes. The firms that qualified for "BOI status"[5] were entitled to duty-free importation of end product related inputs, tax holidays or low corporate tax rates, exemption of various levies, freedom to repatriate profits and off-shore borrowing facilities (Kelegama and Foley, 1999).

A textile quota board also was established in 1992, with the intention of streamlining the allotment of quotas for the garment industry (Kelegama, 2005).

2.4.1 *Importance of the Garment industry to Sri Lanka*

Today the garment industry has grown to become the largest industrial sector from its modest beginnings in 1960s and has weathered turbulent times. The garment industry was badly affected by the nation's civil conflict during 1988-1989, the imposition of countervailing duties and embargo by the United States in 1993 and war–risk premiums and surcharges after the bomb attack on Colombo International Airport in 2001 (Kelegama, 2005). Currently, the Sri Lankan garment industry holds a reasonably good status in the international market. It demonstrated a remarkable growth during the last three decades and now occupies a prominent position in Sri Lanka's industrial structure

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[5] A firm has to satisfy certain baselines in order to achieve BOI status. They criteria are: minimum investment of US$250,000, and should directly export or supply to local exporter 90% of output.

as the largest employer in the manufacturing industry, and Sri Lanka's leading export earner. The garment industry accounted for 56.4% of industrial export earnings and 43.2% total export revenue in 2007 (Kelegama, 2009). Wearing apparel sector is the largest contributor (25%) to the industrial production of Sri Lankan economy in 2012 (Central Bank Report, 2012). Ready-Made Garments (RMGs) contribute 95% of all textile and garment exports of Sri Lanka (Kelegama, 2009). The RMG sector has gained an esteemed clientele for a broad array of international brands such as Abercrombie and Fitch, GAP, Liz Claiborne, Marks and Spencer, Nike, Pierre Cardin, Ralph Lauren, Tommy Hilfiger, and Victoria's Secret. However, at present the industry remains a low value-added industry (Kelegama, 2005).

Table 8 provides evidence of the importance of the garment industry to the Sri Lankan economy in terms of earning income. According to Table 10, RMG share in total exports on average was around 43% during the period of 2003-2007 but it was more than 50% on average in industrial exports during the same time period. Hence, it indicates the Sri Lankan economy's heavy reliance on the RMG sector in earning foreign exchange. However, the growth of the RMG exports had declined by the end of 2007.

Table 8: Textile and Clothing Exports, 2003-07

Exports (In US$ Million)	2003	2004	2005	2006	2007
Total exports	5133.2	5757.4	6351	7740.5	6882.7
Growth of exports		12.2%	10.2%	8.4%	12.4%
Industrial exports	3976.9	4506.1	4952.1	5410.2	5922.7
Growth of industrial exports		13.3%	9.8%	9.3%	9.5%
RMG exports	2400.0	2654.1	2688.0	2917.1	3144.8
Growth of RMG exports		10.6%	1.3%	8.5%	7.8%
RMG share in total exports	46.8%	46.1%	42.3%	42.3%	40.6%
RMG share in industrial exports	60.4%	58.7%	54.3%	53.9%	53.1%

Source: Central Bank Report (2007)

Export growth accelerated remarkably in the 1980s as a result of Sri Lanka's assured quotas, its relatively large, trainable and low cost workforce, and the quality of its infrastructure. The same trend continued up to 2000 and started to decline subsequently. For a second time it grew again in 2002. Figure 10 illustrates the export growth of garments in terms of export value from 2003-2010 and on the whole over the last two decades; the Sri Lankan garment industry has recorded substantial growth. As shown by

Table 8 the percentage of growth declined gradually. By 2008, Sri Lanka's garment exports rose again to US$ 3.3 billion, approximately 270 factories employing about 1 million people and contribute nearly 12% to the Gross Domestic Product (Central Bank of Sri Lanka, 2008). In 2012 the output of the wearing apparel sector increased by 4.2 % compared to 2011 and the textile products sector, which mainly includes weaving of textiles and finishing of textiles, also demonstrated a significant growth of 14.1% (Central Bank of Sri Lanka, 2012).

Figure 10: Export of Garments from Sri Lanka
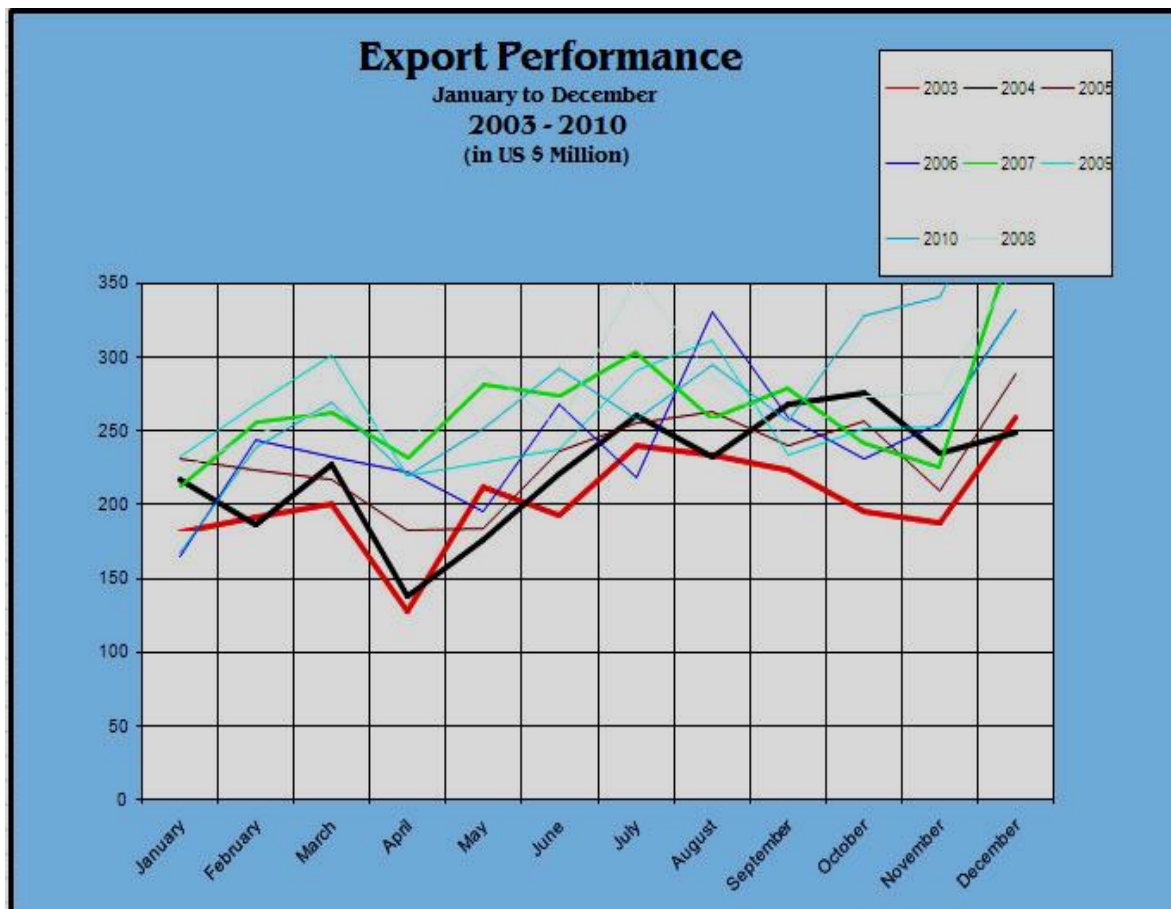
Source: Sri Lanka Apparel Exporters Association (2011)

The garment industry is the only large scale industry that moved to rural Sri Lanka as a viable poverty eradication alternative to traditional fisheries and agriculture industries through the former President Ranasinghe Premadasa's rural development program of building 200 garment factories island-wide (Kelegama,2009). In addition, the creation of employment in the villages established, improved infrastructure such as transportation,

81

electricity, banking, shopping, communication and retailing have also boosted the nation's economy.

2.4.2   Employment

Currently Sri Lanka's garment industry provides employment opportunities for a substantial part of the work force. Especially among the poor households in rural Sri Lanka, the garment industry has become an important source of income. Many workers come from rural areas to the Western Province where most of the garment factories are located. Presently the garment industry provides direct employment to about 310,500 workers and over 51% of them are employed in large factories. The remaining 33% employed in medium and 16% in small factories (Kelegama and Wijayasiri, 2004). A very high percentage (87%) of the workforce in the garment industry is female. More than 60% of these workers are in between the age category of 18-25 (Department of Labour and Oxfam, 2004). Female workers have a tendency for working shorter periods of about five years. Occasionally a woman may work for more than 10 years in a garment factory. Many of the female workers perform non-managerial and non-technical jobs such as machine operators, checkers, helpers, line leaders, ironers and supervisors. Around 84% of senior level management and more than 64% of middle-level management grades are dominated by males (Kelegama and Epaarachchi, 2002).

However according to United Nations Development Program (UNDP) the domestic RMG industry started to shrink from 2003. From 2003 to 2005, 11.7% of decrease was witnessed in terms of the number of factories closed down (UNDP, 2006). Although domestic factories were closed down, large factories performed with tremendous growth (UNDP, 2006). The number of workers employed in the RMG sector also dropped from 340,367 in 2003 to 273,600 in 2005. Most of these displacements occurred in SMEs in which 130,000 employed out of total workforce of 340,367 in 2003 (UNDP, 2006).

2.4.3   Major Export Markets of Sri Lankan Garments

With the support of bilateral agreements, Sri Lanka has enjoyed fairly secure markets for its garments exports; especially from countries such as the USA, the EU, Canada, Norway, Sweden and Finland (Kelegama and Epaarachchi, 2002). The largest export market of Sri Lanka's garments is the USA. Sri Lanka exports around 60% of its garments to USA and around 30% to the EU which is the second largest market

(Kelegama and Epaarachchi, 2002). Other than these two major markets, two new markets were emerged in around 2000. First, the Indo-Sri Lanka Bilateral Free Trade Agreement permits to access the Indian market with 8 million pieces of garments and 50% duty concession (Kelegama, 2001). Second, the Trade and Development Act (TDA) of 2000 permits duty free entry to the USA for garments exports from Caribbean and Sub-Saharan African countries (SLAEA, 2000). This created an opportunity for Sri Lanka to indirectly target another segment of the USA market (Kelegama and Epaarachchi, 2002).

Despite these new opportunities, USA (60%) and EU (30%) markets continue to be the most important two markets with exports growing rapidly in recent years (Kelegama and Epaarachchi, 2002). However in 2012, according to Sri Lanka Apparel Export Association (2013) EU was the main market (50%) and USA was the second largest (40%).

Figure 11 shows the Sri Lankan garments buyers and the proportions in the EU market. The UK is the major market (55%) among the EU countries for Sri Lankan garments. Garment exports to the EU are largely from non-quota basis. In 2000, out of total garment exports to the EU, 83.07% accounted for non–quota basis exports (SLAEA, 2000), because of the international reputation gained by the Sri Lankan garments and the duty free benefit offered by the EU under the MFA agreement.

Figure 11: Sri Lanka Exports to the EU, (2000)
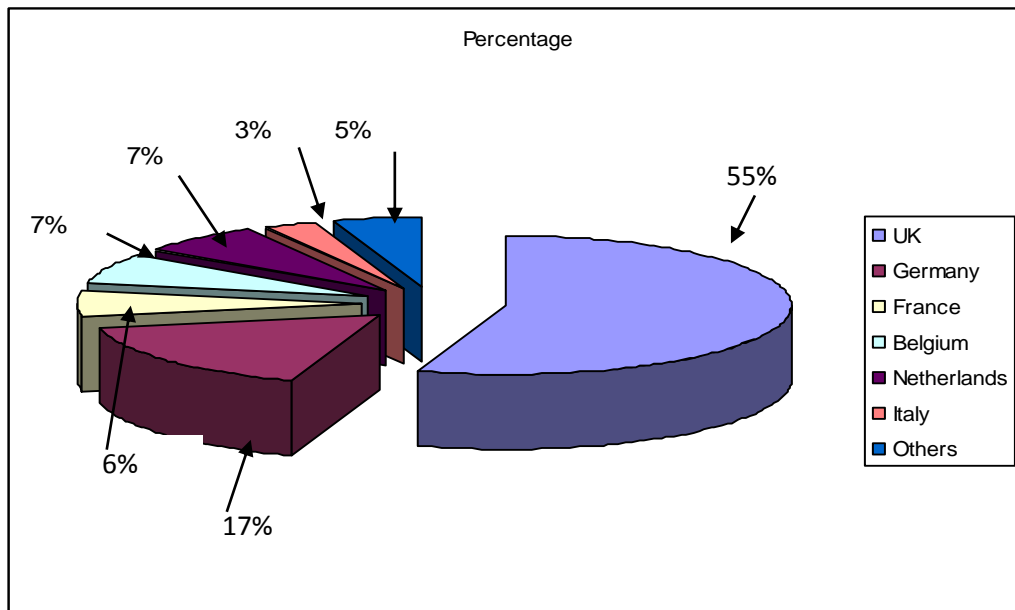
Source: SLAEA (2000)

With effect from July 1, 2005, the European Union-Generalized System of Preferences (EU-GSP) plus scheme of the EU came in to operation. This created an opportunity for Sri Lanka to export garments to the 25 member EU states without duty, provided that raw materials are sourced from South Asian Association for Regional Cooperation (SAARC) countries or EU countries. Sri Lanka currently utilises only 40% of the GSP plus scheme and 60% of the garments exports pay duty (Saheed, 2007). The EU-GSP plus scheme was terminated in August, 2010 and has not affected Sri Lanka's garment exports to the UK. Only one third of garment exports to the EU qualified for GSP plus, whereas the other two-thirds were not affected by the loss of GSP plus (Sukumaran, 2010).

The quota system was terminated in 2004 when the system was dismantled. This compelled the Sri Lankan garment industry to compete for its market share in the global market to maintain market presence and security. Before phasing out the MFA in 2004, industry experts predicted that it would impact badly on the Sri Lankan garment industry. However after the initial shock, the industry managed to remodel itself and recover (Fernando, 2010).

2.4.4 Types of Products Manufactured in Sri Lankan Garment Industry

Three categories of products (apparel, textile and accessories) are predominantly manufactured in the Sri Lankan garment industry. Under the category of 'apparel', blouses, trousers, pants, shorts, sweaters, knitted garments and jackets, foundation garments, briefs and lingerie are produced. Knitted and woven textiles and terry towels are products that come under the category of 'textiles'. Padding, quilting, interlinings, labels, elastics, yarn, thread, buttons, and zippers, lace, socks, stockings and hats are the 'accessories' made by Sri Lankan garment industry. Victoria's Secret, Liz Claiborne, Abercrombie and Fitch, Tommy Hilfiger, Polo/Ralph Lauren, Nike, Eddie Bauer, Pierre Cardin, Charming Shops, Gap, Marks and Spencer, London Fog, C and A, BHS, Calvin Klein, Gymboree, Adams, Halley Hansen, Next, Triumph, Jones New York, Van Heusen, and Tesco are the leading brand names manufactured in the Sri Lankan garment industry.

Sri Lanka's garments bear a high reputation for quality in the international market. Sri Lanka is especially well known as a best quality exporter of women's lingerie (Kelegama, 2005). There are three key varieties of RMG's that Sri Lanka exports:

HS 6204[6]- Women's or girls' suits and similar items

HS 6203- Men's or boy's suits and similar items

HS 6206- Women's or girl's blouses and similar items

Table 9 lists the top 10 apparels of textiles and accessories in 2007 and their HS Codes. HS 61 is the code given to identify the knitted or crocheted apparels. HS 62 represents not knitted and or crocheted apparels. In 2004, a major change of shift away from HS 62 towards HS 61 took place in apparel exports. In 2007, HS 61 accounted for 40.8% of the total apparel exports (Kelegama, 2009). The products mentioned in Table 9 are sub product categories that fall under the main HS Code of 61.

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[6]HS Code- A sub heading code given to each category of production for the purpose of easy identification.

Table 9: Top 10 Exports of Apparel and Accessories in 2007

HS Code	Product Description
610910	T-shirts, singlets and other vests, of cotton
610821	Women's or girls' slips, petticoats, briefs, panties, nightdresses, pyjamas, negligees, bathrobes, of cotton
611610	Gloves, mittens and mitts, knitted or crocheted, coated or covered with plastics or rubber
611020	Jerseys, pullovers, cardigans, waist-coats, and similar articles, knitted or crocheted, of cotton
610990	T-shirts, singlets and other vests, knitted or crocheted, of other textile materials
610510	Men's or boys' shirts, knitted or crocheted, of cotton
610462	Women's or girls' suits, ensembles, jackets, dresses, skirts, divided skirts, trousers, bibs, of cotton
610711	Men's or boys' underpants, briefs, nightshirts, pyjamas, bathrobes, dressing gowns and similar articles of cotton
610822	Women's or girls' slips, petticoats, briefs, panties, nightdresses, pyjamas, negligees, bathrobes, of manmade fibres
610829	Women's or girls' slips, petticoats, briefs, panties, nightdresses, pyjamas, negligees, bathrobes, of other textile materials

Source: Kelegama (2009)

However, in the five year strategic plan formulated in 2002 by the Joint Apparel Association Forum (JAAF), the apex body of the garment industry, the stakeholders decided to focus on four product categories and develop a reputation for these areas. The key product groups being exported are casual wear, sportswear, intimate apparel and children's wear (which are the product niches identified in the industry strategic plan of 2002). Sri Lanka has already gained the reputation for its trouser category with high-end finishing capabilities. It has also now gained reputation as the 'lingerie capital of the world' due to its superior capabilities in this product group.

2.4.5 Industry structure

The Sri Lankan apparel industry consists of approximately 891 manufacturing companies of which about 75% to 80% of them are classed as SMEs (Asian Textile Industry, 2007).

Table 10 shows the number of garment factories which exist under each category of small, medium and large. The SME definition of Tertiary and Vocational Education Commission (TVEC) has been used to classify the size of the establishments.

Table 10: Size Distribution of Garment Factories

Size	Number of Factories Exist
Small (Less than 100 employees)	282
Medium (Between 101-500 employees)	445
Large (Between 501-1000 employees)	131
Extra Large (More than 1000 employees)	33

Source: TVEC (1999)

The apparel giants of Barefoot, Brandix, Hayleys, Hemas Garments, Hidramani Group Jinadasa Holdings, KASH Garments, MAS Holdings and Odel dominate the garment industry in Sri Lanka.

Sri Lanka's free trade zones have been the key player of economic development and inflow of foreign direct investment into Sri Lanka. The country's free trade zones are seen as benchmarks of successful implementation of zone development strategies (Tilakaratne, 2006). The government, together with the BOI, is maintaining eight industrial processing zones, three industrial parks and one export processing park to encourage foreign and local investors. These sites are available for investors in well-developed and fully serviced industrial estates at competitive costs within 30-50 km distance from the major distribution centers such as port and airport. The Katunayake Export Processing Zone (KEPZ) in particular, has served as a model zone in the Asian region.

The Sri Lankan Garment industry is highly dependent on imported inputs, especially fabrics and other accessories. Over 80% of the required fabric inputs are imported (Saheed, 2007). A large number of garment manufacturing factories focus the export market. However, a considerable volume of sub-standard grades of export quality garments are released to domestic market. Therefore, on average annual garments imports

have come to a minimal of US$ 150 (Saheed, 2007) which possibly contributes to the value added context of the industry.

2.4.6 *The Geographical Distribution of the Garment Factories*

A heavy concentration of garment factories can be seen within the Western Province (Figure **12** 12), mainly due to the superior infrastructure facilities such as, roads, communications, airport and harbour and other services available in Colombo city and within the region (Thilakaratne, 2001). As the national Department of Labour and Oxfam (2004) state, in 1999 over 72% of the garment establishments were in the western province, generating employment to 65% of the total workforce in the garment sector. This has caused several problems such as scarcity of labour, road blocking, environmental pollution and population congestion.

Figure 12: Provinces of Sri Lanka
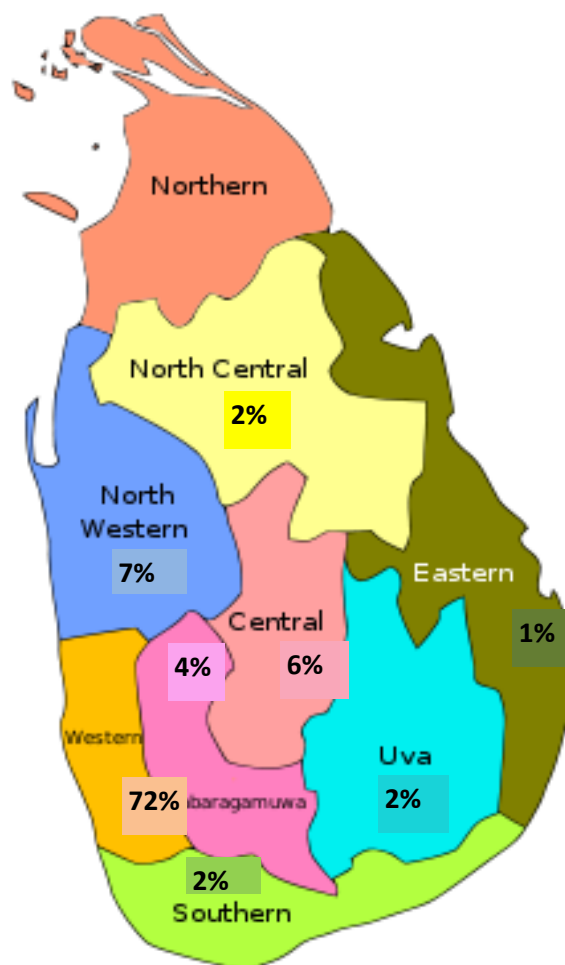
As can be seen from Figure 12, other provinces of the country had the following concentration of garment factories: Southern 6%; Central 6 %; North Western 7 %; North Central 2 %, Uva 2%; Sabaragamuwa 4 % and Eastern 1%.

2.4.7 Joint Apparel Associations Forum (JAAF)

JAAF, established in 2002, is the principal body that coordinates, sustains and develop the apparel industry in Sri Lanka. JAAF was established by coordinating a number of associations including Sri Lanka Apparel Exporters Association, Free Trade Zone Manufacturers Association, National Apparel Exporters Association, Sri Lanka Chamber of Garment Exporters Association and Sri Lanka Garment Buying Offices Association. JAAF addresses the various issues in the Sri Lankan garment industry through the work of various sub committees of Backward Integration, Bilateral/Multilateral Trade, Human Resources Development, Logistics and Marketing and Image Building. JAAF identified the Sri Lankan garment industries pitfalls and developed a comprehensive five year strategic plan with the aim of upgrading the industry. The following steps were developed to ensure the industry became fully-integrated (Kelegama, 2009, p. 592).

1. Encourage backward integration

2. Improve human resource capital/technology

3. Change labour laws and regulations

4. Promote Sri Lanka's image as a complier with high labour standards

5. Cater to the needs of small and medium-scale industries

6. Strengthen bilateral and multilateral links with key nations

7. Lobby the government for improved infrastructure

8. Mobilise funds to implement changes.

A comprehensive analysis of "strengths", "weaknesses", "opportunities", and "threats" (SWOT) of the garment industry has also been carried out in five year strategic plan that led to the benefits of eliminating weakness, consolidating strengths, making use of opportunities and minimizing threats (Kelegama, 2005).

a) Sri Lanka Chamber of Garment Exporters

The Sri Lanka Chamber of Garment Exporters was established in 1992: "to be the voice of the garment industry SME sector in all national and economic forums; to keep garment

industry SMEs informed of the most recent trends and developments in the international market; and to explore new opportunities in the garment industry and develop the SME sector." This is the only body which addresses the problems and interests of the garment industry SME sector and it had also incorporated a separate chapter in five year strategic plan about developing SMEs.

2.4.8   SCM Issues in the Garment Industry of Sri Lanka

The Sri Lankan garment industry is disadvantaged by several reasons. On the whole, the garment factories experience low labour productivity, high manufacturing cost and lead time, high hourly wage cost, lack of product development, weak backward integration and limited direct contact with leading global buyers (Tirimanne and Ariyawardana, 2008; Kelegama, 2009; Kelegama, 2005) which are the different aspects of an effective supply chain. The hourly wage rate of Sri Lanka is US$0.5 which may appear to be very low but, as Thilakaratne (2006) suggests, this is still higher than the competing countries in the region such as Bangladesh, Vietnam and Pakistan (US$0.4) and Indonesia (US$0.3). Kelegama and Wijayasiri (2004) state that relatively higher wage rates exist in the other competing countries like Malaysia (US$1), China (US$0.7) and Thailand (US$1.2). The high wage cost is only a one factor contributes to the high unit cost of production. The lack of raw material base, absence of product development and design capacity, low technology and lack of information about new markets are the other factors contributed to the high unit cost of production leading to low value added (Thilakaratne, 2006) which are yet again the aspects of a supply chain. The problems of information sharing and high lead-times in low cost labour countries lead to a re-examination of SCM strategies (Agarwal and Farrell, 2003).

Weerahewa and Ariyawardana (2003) state that 95% of the inputs (fabrics and accessories) are imported, therefore exposing firms to excessive lead times since buying offices from the USA or Europe in Sri Lanka coordinate orders and check the quality of the products. Buying offices play a major role in selecting appropriate suppliers from Sri Lanka and supplying raw materials to garment manufacturers of Sri Lanka. Therefore Sri Lankan garment manufactures depend on the foreign buying offices. They do not have direct contact with up-stream buyers and coordinate orders via buying offices. Due to the shortage of fabric and accessory base (a lack of vertical integration) the lead time of Sri Lanka's garment industry remains between 90 to 120 days, compared to the average lead

time in the global market is 60 days (Kelegama, 2005). This has been a major issue with the high competitiveness of the global market in the industry. The over dependency of imported raw materials reduce the value addition in the garment industry (Kelegama and Epaarachchi, 2001). That is the reason why, in the 1990s, a collaborative effort between government-appointed delegations and overseas large textile producers was initiated to enhance backward linkages in the Sri Lankan garment industry. But still the Sri Lankan garment industry remains a low value-added industry (Kelegama, 2005). Generally the export price of Sri Lanka garments is a sixth to a quarter of the complete garment price. In Singapore it ranges from a quarter to a third. The reason for this difference between the final export prices of the two nations is that Singapore garment manufactures have been able to control their suppliers by having direct contacts whereas Sri Lankan manufactures have failed to develop such relationships (Kelegama and Foley, 1999). Around 65% of RMG are exported through buying offices in Sri Lanka (Kelegama, 2009). Due to the lack of contact with direct buyers and suppliers, the foreign buyers and investors are uninformed that Sri Lanka is a prospective supplier (Kelegama, 2009). The small sized garment manufacturers are not capable of supplying fabrics to readymade international garments sectors (Kelegama, 2009).

The Sri Lankan garment industry has reported remarkable growth during last two decades but significant suppliers to this industry have not developed as expected (Kelegama and Foley, 1999). Hence weak backward integration and high turnaround time have been considered as two main issues that the Sri Lanka garment industry struggles with (Kelegama, 2009). As a result of just-in-time sourcing in the RMG sector, retailers order small-sized batches of a variety of products with a short lead time. To fill and ship an order on time producers and distributors need to work at high speed. To achieve this, sophisticated supply chain management and production techniques are required. But the lack of backward integration and dependence on imported inputs increases the cost of production and lead times (Kelegama, 2009) thereby reducing the profitability of the RMG sector. The failure to promote vertical integration in the Sri Lankan garment industry has made the industry uncompetitive in the global market (Kapuge and Smith, 2007).

The total international apparel supply chain face the logistics problems of shortening the product life cycles, different manufacturing locations and various vendors and increasing

costs (Pang, 2004). This negatively affects low cost labour (LCL) countries when they try to cope up with global logistics especially with the effort of reducing the cost of manufacturing. Third Party Logistics (TPL) has effectively helped LCL countries in avoiding the high-freight costs (Kumar and Arbi, 2008).

Buyer-driven commodity chains are typical to the garment industries (Knutsen, 2003). The upstream of the garment industry is where the input-output structure starts. It is usually the production of cotton or the chemical industry which produce synthetic fibres. The midstream industry is the spinning and weaving industry and the downstream is the garment industry. The firms producing accessories such as thread, padding, shoulder pads, poly-bags, buttons, and hangers represent the backward linkages of the garment industry (Knutsen, 2003). Although backward integration plays a pivotal role in making a nation's garment industry competitive, Sri Lanka's garment industry faces numerous issues in backward and forward integration which makes it uncompetitive in the global market (Kelegama and Foley, 1999).

As a result of identifying the main SCM issues that Sri Lankan garment industry face, the Joint Apparel Associations Forum (JAAF) included promoting backward integration in the Sri Lankan garment industry as one of the main objectives of their five-year strategy which commenced in 2002 (JAAF, 2006). So far, however, there has been little academic discussion about solutions to the SCM issues faced by the Sri Lankan garment industry.

2.4.9 Summary

The transaction costs, combination of specific resources, an organisational network and principal and agent relationship affect the supply chain of an organisation regardless of its size. Lean and agile manufacturing are also common in SMEs and large enterprises. However several ways of combining these two practices can be seen to achieve the best possible impact through the implementation of supply chain management strategies in organisations including SMEs. Flexible manufacturing, QR, RFID, JIT, leagility and CMI are some of the common SCM practices implement among the apparel industry firms. The excellent supply chain management strategies of Zara and Benetton have been one of their key success factors.

The SME sector plays a key role in the developed and developing nations generating employment opportunities and revenue. The developing nations largely depend on SMEs to solve their major economic problems of poverty and unemployment. However, the failure of SMEs has become a major challenge to all governments. Therefore solving the problems faced by SMEs is gaining importance in the context of economic development of a country. SCM related problems are common among these failure factors and therefore the implementation of improved SCM strategies is vital for the growth of SMEs.

Sri Lanka's garment industry is crucial to the Sri Lankan economy because it plays a pivotal role contributing to earning foreign income and generating employment. Currently it is disadvantaged by several drawbacks in the industry. The weak SCM strategies are one of the main problems among them which make the industry less competitive in the global market.

Both SCM and SME related literature collectively reveal the importance of implementing effective SCM strategies for improving the performance of SMEs. However past studies that have investigated the importance of SCM in manufacturing SMEs are very limited, particularly in the garment manufacturing industries of emerging economies. The implications of SCM for SMEs is not rigorously reviewed (Thakkar *et al.,* 2008) and therefore as an attempt to address the gap in the literature, this research is conducted with the aim of enhancing knowledge of current SCM practices in the Sri Lankan garment manufacturing sector by exporting SMEs and the barriers faced in improving them. It will then contribute to the wider literature on SCM and SMEs. It will particularly be of value to SMEs in emerging economies in which seek to improving their current SCM practices.

Chapter 3. Research Design

3.1 Introduction

The overall purpose of this chapter is to outline the methodology underpinning this research and justify the chosen research strategy. Section 3.2 describes the main research methodologies and position of the case study method within the basic research methodologies.

Section 3.2.1 introduces and describes the methodology for this research. This involves outlining the theoretical and practical reasons for selecting a case study based approach. The case study design is discussed in terms of: the unit of analysis, number of cases, data collection methods, time period of case studies and strategy for data analysis.

Section 3.11 details and justifies the procedures undertaken regarding the selection of cases, and then presents an overview of the chosen cases, case study questions, conducting case studies (stage 1 and 2), data analysis (stage 1 and 2) and ends with a discussion of ethical considerations. Two major stages of data collection along with initial telephone interviews were carried out.

3.2 Primary Research Methodologies

Research methodologies are primarily classified into quantitative and qualitative depending on the nature of data used in the research. Ellram (1996) presents the basic research designs (Figure 13) based on the types of data and analysis that are used in qualitative and quantitative research designs. It is suggested there are two types of data: empirical and modelling. Empirical data are gathered from real world circumstances mainly through the techniques of surveys and case studies. Modelling data are manipulated through the models such as simulation, linear programming and decision analysis. As can be seen from the Figure 13, both types of data can apply quantitative or qualitative analysis and case studies are primarily qualitative and based on empirical data.

Figure 13: Basic Research Designs

Types of Analysis

		Primarily Quantitative	Primarily Qualitative
Types of Data	Empirical	Survey data, secondary data, in conjunction with statistical data such as: factor analysis cluster analysis discriminant analysis	Case studies, participant observation, ethnography. characterised by: limited statistical analysis, often non-parametric
	Modelling	• simulation • linear programming • mathematical programming • decision analysis	• simulation • role playing

Source: Ellram (1996, p. 96)

On the other hand both methodologies can be used in a single research project, like case study research (Yin, 1993). Case studies can be used to construct theories (Johansson, 2003). Theory development is carried out based on the two approaches of deductive theory testing and inductive theory building (Perry, 1998). Easter-by-Smith *et al.* (1991) explain the difference between these two approaches using scientific paradigms. Table 11 presents these different scientific paradigms and their features. They further state that the deductive approach represents the positivist paradigm and inductive approach represents the phenomological paradigm.

Table 11: Scientific Paradigms

Paradigm	Deduction/induction	Dimension (objective/subjective)	Status of the research findings
Positivism	Deduction	Objective	Objectivist: findings are true
Critical theory	Induction	Subjective	Subjectivist: value mediated findings
Constructivism	Induction	Subjective	Subjectivist: created findings
Realism	Induction	Subjective	Modified objectivist: findings probably true

Source: Adapted from Perry (1998, p. 786) and Healy and Perry (2000, p. 119)

The phenomological paradigm builds up with the three sub paradigms of critical theory, constructivism and realism. The positivist paradigm interprets reality through a "one-way" mirror (Guba and Lincoln, 1994). Positivists believe that a data set is timeless and does not change because they are 'observed' so the findings are true and objective. On the other hand, critical theory criticises the social, political, cultural, economic, ethnic and gender values. Hence according to the critical theory research, investigations are long term historical processes. Critical theory research findings are value-based and subjective (Healy and Perry, 2000). Constructivists hold the view of that reality is context-based and consists of "multiple realities" so the research findings are created and subjective (Guba and Lincoln, 1994). Realism considers that there is a genuine "reality" to reveal although it is imperfectly apprehensible (Merriam, 1988; Guba and Lincoln, 1994). Hence the research findings are probably true (Healy and Perry, 2000).

Case studies belong to the realism paradigm. Boing (1994) advocates that the right paradigm for case studies is realism as case study areas are often contemporary and pre-paradigmatic. Therefore these research areas should be based on inductive theory building as finding established theories will be difficult (Perry, 1998). Hunt (1991) argues that since case studies possess external reality and realism does not involve any aspect of relativism, like that of constructivism and critical theory, realism is the right paradigm for case studies. Further he argues that the case study method involves perceptions of real world phenomenon which are "unobservable". Moreover, Perry (1998) explains that, since case studies address descriptive research questions rather prescriptive, realism is the appropriate paradigm for case studies. Each research paradigm consists of the three elements of: ontology, epistemology and methodology. Ontology is the "reality" being examined by the researcher. Epistemology involves the relationship between the researcher and the "reality" being studied. The methods used by the researcher to examine the reality being considered are the methodology. The realism paradigm explores multiple perspectives about a single reality (Healy and Perry, 2000).

However, Van Wynsberghe and Khan (2007) propose entirely different logic. They suggest that case studies can be applied irrespective of different research paradigms (critical theory, constructivism, realism) and disciplines (social science, applied science, business, fine arts, etc.). Alternatively, Flyvbjerg (2006) claims that good social science enquiries are not methodology-driven but problem-driven. Therefore case studies enrich a

social science enquiry with unexpected findings which quantitative methods alone cannot be reached.

3.2.1 *"Case Study" and "Case"*

It needs to be made clear that the case and case study are two different ideas (Johansson, 2003). The case study should have a case to study. The case is the object of the case study. Yin (1989) discusses the difference between the "case" and "case study". A "case" can be an event, an entity, an individual or a unit of analysis. A case study is "an empirical inquiry that investigates a contemporary phenomenon within its real life context using multiple sources of evidence" (Yin, 1989, p.5). Yin (1994) points out that the methods and techniques of carrying out a case study are also very important in a case study. A case study is the desirable method to investigate the phenomenon, when the boundaries are indefinable between a phenomenon and its context (Yin, 2003). But, in contrast Stake (1998) places more emphasis on the object of study than the methods in a case study. Creswell (2002) defines a case study as a comprehensive understanding of a "case" or bounded system (an event, activity, process, or one or more individuals). Anderson (1993) explains case studies as investigations of how and why events occur; they can also be observation of contextual realities. The case study method is the appropriate method when it is intended to explore and study an area in depth (Patton, 1987). However the selection of a case or identification of unit of analysis should be done with care. In terms of case studies Noor (2008), describes that a case study is not a method of studying a whole organisation but it will study only a particular issue in an organisation.

Besides the broad range of definitions discussed above, in the literature case studies are identified in various ways; as a method, methodology and a research deign (Yin, 1994; Bassey, 1999; Orum *et al.,* 1991). Merriam (1988) defines case study as a method of conducting research. He defines a case study as a way of examining multifaceted social units of potential importance in understanding the phenomenon (Merriam, 1988). A case study has also been defined as a research strategy. Gerring (2004) states that a case study is a research design that aims to study a single unit intensively (a relatively bounded phenomenon). Stake (2005) argues that case study is not a methodology, but it provides a methodological view of what is to be studied.

As a result of considering different viewpoints to define case studies, VanWynsberghe and Khan (2007, p. 90) propose that "case study could be considered a trans-paradigmatic and trans-disciplinary heuristic that involves the careful delineation of the phenomena for which evidence is being collected". They further conclude that a case study is not completely disclosing the case itself, but it is also about discovering the unit of analysis.

Yin (2003) suggests four occasions of when it should use a case study approach in a research:

- If the purpose of research is to answer "how" and "why" nature research questions.
- If it is impossible to manipulate the behaviour of those who engaged in the research.
- If it is required to discover contextual conditions as the researcher believes that they are relevant to the reality under study.
- If it is difficult to identify phenomenon and context separately.

The case study approach was selected for this research for number of reasons. First, the overall purpose and research questions of this research (see Sections 1.5 and 1.6); it is set out to identify the successful SCM strategies in the Sri Lankan garment exporting SMEs, reasons behind the successful SCM strategies and constraints they find in improving SCM strategies. Out of Yin's (2003) aforementioned occasions as to when case studies should be conducted, the two occasions of "if the purpose of research is to answer "how" and "why" nature research questions" and "if it is required to discover contextual conditions as the researcher believes that they are relevant to the reality under study" are especially applicable to this research. The researcher was challenged with identifying the successful SCM strategies in Sri Lankan garment exporting SMEs, HOW successfully have SCM strategies been implemented and WHY they find it difficult to improve existing SCM strategies. Therefore the purpose and questions of this research were designed to answer "how" and "why" nature questions. Also, the researcher believed that, as suggested by different SCM theories discussed Section 2.2.2, the contextual conditions of resources, networks, members of the supply chain and transaction procedures are affected by the level of implementation of SCM strategies in an organisation. Hence it is difficult to

study the SCM strategies without studying the organisational context of selected garment exporting SMEs in Sri Lanka.

Action research was not employed in this thesis. The purpose of action research is also to generate new knowledge as with all other research methodologies. A 'researcher' is an 'independent' observer' in case study research while in action research, the researcher is an 'active participant' (Prybutok *et al.,* 2005). The main feature of action research is thus the researcher's direct collaboration with others to solve problems and implement solutions (Baker and Jayaraman, 2012). This can generate additional insights but while the case study companies agreed to discuss their SCM practices, this did not extend to the researcher being allowed to participate in decision-making and thus action research was infeasible in this case.

Second, limited research has been carried out in relation to the Sri Lankan SME sector and none have specifically focused on the SCM strategies of the Sri Lankan garment industry SMEs. Therefore, an exploratory, qualitative research approach was desirable to understand, rather than confirm, success factors.

Third, there are numerous examples of case studies being used effectively in studying SCM related problems in SMEs. Also the methodological literature suggests that the case study method is increasingly applicable to SCM and SME research as an effective research methodology (as further explained in Section 3.9 and 3.10).

In terms of research design, once the decision is made to use a case study approach in a research, then the boundaries of case should be identified. This helps to differentiate the "case" of the study from what it is not (Yin, 2003; Stake, 1995). The main purpose of this research was to acquire knowledge of the current, successful SCM practices in the Sri Lankan garment exporting SMEs. Therefore the "case" of the research was the successful SCM strategies in selected Sri Lankan garment exporting SMEs. The researcher studied all different aspects of SCM: relationships with suppliers and customers, new product development, information technology and third party logistics. Therefore the unit of analysis for this research was the supply chain of each selected organisation so that the unit of analysis was different to each organisation. The unit of analysis was evolving as it

depended on each organisation that was selected for the research. In some cases the supply chain of the firms was predominantly internal whereas in some others broadened to external links. However this research focused on a single unit of analysis which is the SCM strategies of each selected organisation (Yin, 2003).

The researcher employed the SCM definition of Mentzer *et al.* (2001) (see Section 1.2). This definition itself sets boundaries to identify the successful SCM strategies in SMEs that were selected to study for this research. Accordingly, the researcher studied the strategies of coordinating the traditional business functions and the tactics across these business functions within the companies, businesses and the supply chain.

3.3 The Role of Theory in Case Study Method

In social science, quantitative research has developed overtime to cope with the measurement of ambiguous latent variables however it is qualitative research that remains the principal method of understanding complex human processes and systems (Denzin and Lincoln, 1994). Qualitative research provides an interpretive and naturalistic meaning to phenomenon being studied (Denzin and Lincoln, 2005). Therefore other than hypothesis testing there are instances of discovery and interpretation of world phenomenon in social science (Merriam, 1988). Social science is based on multiple theoretical orientations compared to natural science (Anfara and Mertz, 2006). In qualitative research the role of theory is very important as theory provides the researcher with direction under research conditions that are often ambiguous and complex (Denzin and Lincoln, 2005). Creswell (2007) emphasises that the role of theory varies depends on the type of qualitative research design used in a study. Especially in case study design, theory plays a major role. Yin (2009) stresses the fact that case study research should identify the theoretical perspective of the investigation as it influences the research questions, analysis and interpretation of findings. Theory helps case studies in different ways. The following are the different roles played by theory in conducting case studies (Yin, 1993, p.4). Theory helps to:

- Select the cases to be studied and decide whether single or multiple cases should be studied.

- Specify the things to be explored especially in exploratory case studies.

- Define a complete and appropriate description in descriptive case studies.

- Stipulate rival theories in explanatory case studies.

- Generalise the results to other cases.

It is evident that the role of theory in case study research takes different forms depending on the type of case study design used in a research. A theory should not necessarily be based in causality. It can be a design of research steps supported by relationships in literature, policy issues or any other relevant source (Yin, 1993). However when investigating a new phenomenon, researchers may not always find applicable existing theories (Kohn, 1997). In such situations, "theory of action" can be used which is a logic model (Patton, 2002). Theory of action characterises the problems to be studied through highlighting the areas where uncertainty is very high about an intervention. Thus, it helps to identify the most significant areas to study.

The literature review chapter discusses (see Section 2.2) the theoretical background of SCM on which this research is based. The theories discussed strongly influenced the number of cases (single or multiple) and identifying the areas to study. The resource-based view of the firm suggests that the resource base effect on the level of implementation of SCM strategies in an organisation. The Social Network Theory highlights the importance of the relationships in a supply chain. The Transactions Cost Approach explains how to minimise transaction costs in a supply chain. The Agency Theory discusses how the conflicts should be minimised in between principal and agents in a supply chain. Therefore it is obvious that these theories provide clear guidance in selecting the cases and areas to study under this research.

3.4 Criticisms of the Case Study Method

Ellram (1996) suggests that the case study method has often been criticised due to the lack of understanding of its applications. Also, the conventional view of case studies argues that a case and case study will not be of value, unless they are connected to hypotheses (Flyvbjerg, 2006). Dogan and Pelassy (1990) further point out that a case study can be explained only based on general hypotheses. As a result of summarising the conventional wisdom about case study research, Flyvbjerg (2006) identifies four misunderstandings about the case study approach:

- Case studies are extremely contextualised and therefore cannot be used for predictions

- Case studies cannot contribute to scientific development as they cannot make generalisations
- Case studies are more useful in the first phase of total research design
- Case studies are biased as the researcher is trying to verify a preconceived notion

Generally, it is difficult to summarise case studies and develop theories and propositions based on them. Flyvbjerg (2006) and a few other authors criticise and refuse these misconceptions. Generalisations can be made through case studies by comparing the current case with previous knowledge, theories and experience (Yin, 2003). Strategic selection of cases increases the generalisability of case studies (Ragin, 1992). The strategy for case selection (random selection, information oriented selection, critical cases, paradigmatic cases) is based on the objectives of the research. Selecting the right case selection strategy increases the amount of information it produces and thereby increases the scope for testing hypotheses (Vanwynsberghe and Khan, 2007). The researchers who have carried out case studies with in-depth interviews concluded that the research results were totally opposite to what they expected and therefore case studies cannot be biased (Ragin, 1992). Case studies include narratives and they cannot be summarised into a scientific formula, proposition or theory (Mitchell and Charmaz, 1996). VanWynesberghe and Khan (2007) argue that the unit of analysis should be clearly identified in case study research so that the key message of case is clear. Despite all of this, Yin (1994) shows that irrespective of these disagreements there is a growing trend of using the case study method in business research.

3.5 Types of Case Studies

Selecting a type of case study depends on the overall aims and objectives of the research (Baxter and Jack, 2008). Yin (2003) and Stake (1995) hold two different classifications of case studies. The different types of case studies proposed by Yin (2003) are summarised in Table 12. He categorises case studies from two different perspectives: single and multiple cases (based on the number of cases utilised in a study). Exploratory, explanatory and descriptive case studies are identified based on the nature of the overall purpose of the research. Usually in a case study design these two types of classifications are combined.

Table 12: Types of Case Studies

Type of Case Study	Definition
Explanatory	Presents a causal link between the cause and effect. More often used, when the research question is too complex for a quantitative study.
Exploratory	Used when the reality being studied has no clear, single set of outcomes. Usually intended to define hypotheses and research questions of a subsequent study.
Descriptive	Used to describe a phenomenon comprehensively together with its real life context.
Multiple-case studies	Employing more than one case in a single study. Used when a comparison is needed between cases based on a theory.
Single case studies	Focuses in-depth only on a single case.

Source: Yin (2003)

Alternatively, focusing on the purpose for the selection of cases Stake (1995) distinguishes between three case study designs: intrinsic, instrumental and collective. Similar to Yin (2003), Merriam (1988) proposed three types of case studies: descriptive, interpretative and evaluative. Moreover, Stenhouse (1983) identifies two types of single case study designs: "neo-ethnographic" and "evaluative". He also stressed the importance of multiple case studies.

This research employed multiple cases (defined in Table 12) as the researcher aimed to study the successful SCM strategies being implemented in Sri Lankan garment exporting SMEs. Multiple case evidences are found to be more convincing than single case evidence (Yin, 2003). Ability to examine similarities and differences among multiple cases leads to strengthen a theory (Noblit and Hare, 1988). Miles and Huberman (1994, p.172) expressing the goals of multiple cases mentioned that:

"One aim of studying multiple cases is to increase generalizability, reassuring yourself that the events and processes in one well-established setting are not wholly idiosyncratic. At a deeper level, the aim is to see process and outcomes across many cases, to understand how they are qualified by local conditions, and thus to develop more sophisticated descriptions and more powerful explanations".

Stake (2005, p.22) states that "the benefits of multiple case study will be limited if fewer than, say, four cases are chosen, or more than 10". The number of cases selected for this research was based on information oriented (Vanwynsberghe and Khan, 2007) case selection strategy so it depended on the availability of required information from different garment industry exporting and manufacturing SMEs. Further Hedges (1985, pp.76-77) states that "In practice, four to six groups probably form a reasonable minimum for a

serious project". Six cases were chosen for this research depending on the availability of research participants. The managing director and purchasing/logistics or operations manager/merchandiser of each company were interviewed. Ruyter and Scholl (1998) suggest that generally qualitative research will have 10-60 interviews and this research had about 20 interviews except the initial telephone exploratory interviews. However, Patton (1990, p.185) highlights that "the validity, meaningfulness and insights generated from qualitative inquiry have more to do with the information-richness of the cases selected and the observational/analytical capabilities of the researcher than with sample size".

Initially the case studies were exploratory as the researcher's first requirement was to determine on a criteria to identify how successfully SCM strategies have been implemented in the Sri Lankan garment exporting SMEs. Then the subsequent investigation of the selected cases was into explanatory nature as the researcher probed these successful SCM strategies in-depth along with the reasons behind them. Besides, the researcher aimed to study the cases furthermore to identify why they find it difficult to improve the existing SCM strategies (see Sections 3.11 and 3.12).

3.5.1   Time Period of Cases

The time period of case studies vary from one case study to another. Orilkowski and Baroudi (1991) explain four different categories of case study time periods: one-shot cross sectional, cross sectional over multiple time periods, longitudinal and process traces. Cross-sectional is one shot research of a particular phenomenon. Multiple time periods involve several time intervals. Longitudinal time period employ an uninterrupted period of time to investigate the phenomenon. Process traces are the case studies which focus on discrete events over a certain time period but it is not continuous as longitudinal. The time period of the case studies for this research was multiple time periods largely due to the practical reasons (see Sections 3.13 and 3.16).

3.6 Reliability and Validity of Case Study Research

The lack of generalisability is one of the major criticisms of case studies (Ellram, 1996). Data overload can affect the reliability and validity of case study analysis. However, the threats to reliability and validity of case studies can be minimised through careful design of case studies (Kohn, 1997). Reliability addresses the issue of whether the experiment

can be replicated to receive the same results (Yin, 1981). Silverman (2005, p. 210) defines reliability as "the degree of consistency with which instances are assigned to the same category by different observers or different occasions." Transparency and replication are the methods of determining reliability in case studies, especially in multiple case study analyses (Gibbert and Ruigrok, 2010). They also suggest that transparency can be achieved through maintaining records of research procedures carried out by the researcher, most commonly such as a case study protocol. Yin (1994) suggests that the replication method focuses on the overall pattern of results and attempts to determine the extent to which the predicted patterns similar to observed patterns. Initially a single case is explored to identify a pattern and then investigate subsequent cases in order to make sure that the same pattern is existed. If the same pattern was observed over multiple cases examined, the literal replication is assured in the study. If the results were different from each other and still the reasons are predictable then theoretical replication is assured in the study.

Validity is the accuracy of results obtained through case studies. Validity takes several forms of internal, external and construct validity. Internal validity is applicable to both single and multiple cases whereas external validity is considered only in multiple cases (Kohn, 1997). In case study research external validity is the ability of generalising results to a broader theory (Yin, 1994). As a result of cross-case analysis carried out by Eisenhardt (1989) it was found that the majority of cases analysed provides a strong basis for generalisation. The replication methods ensure the external validity of multiple case studies. If results are replicable over the multiple cases, findings tend to be more valid (Kohn, 1997).

Internal validity is considered in explanatory case studies as the researcher's effort to identify a cause and effect relationship of phenomenon being studied. Internal validity is also known as "logical validity" (Cook and Campbell, 1979). Internal validity is used to explain the reason for an outcome to be demonstrated in a particular phenomenon (Yin, 1981). The literature suggests three strategies to improve the internal validity of case studies. One strategy to guarantee the internal validity of a case study is to evaluate whether the research framework suggested in the research is based on literature or not (Yin, 1994). The next strategy is pattern matching through which the observed or predicted patterns are compared with the patterns suggested in the literature (Eisenhardt,

1989). Theory triangulation is the third method. Different theories and research frameworks are used as guidance for data analysis and the interpretation of findings (Yin, 1994).

Construct validity concentrates on formulation of appropriate operational measures for the concepts being studied (Yin, 1994). Denzin and Lincoln (1994) state that construct validity of a procedure is the extent to which a research accurately observes reality. The literature suggests three strategies to enhance the construct validity of case study research. The first is data triangulation by which different angles are used to view the same phenomenon (Pettigrew, 1990; Stake, 1995). Thus in a case study, multiple sources of data such as documentation, archival records, interviews, direct observation, participant observation and physical artefacts should be pursued (Yin, 1994). However, as a contrasting view of data triangulation Silverman (2005) argues that qualitative research is not intended to reveal the reality, although different perspectives of the same phenomenon are employed. The second strategy is to maintain a chain of evidence eliciting the total research approach from research questions to conclusions (Yin, 1994). Further, if the actual data collection protocols were changed from those planned then they should be disclosed by the authors. The third strategy of enhancing construct validity is to have a draft reviewed by key informants involved in the case study (Ellram, 1996). The participants and other key informants should be given the case study report and have a release form signed certifying that facts in the report are accurate.

Lincoln and Guba (1985) suggest four criteria for the evaluation of qualitative research: credibility, dependability, conformability and transferability. Credibility is the extent to which the results are credible. The degree to which the results are dependable is the dependability. Conformability refers to the degree that the findings are supportable to make conclusions. Transferability is the extent to which the results can transfer to other similar contexts. Seale (1999) states that the "reliability and validity" of qualitative research reflects through the trustworthiness of the research findings.

As a result of summarising qualitative case studies from 1971 to 2006, Beverland and Lindgreen (2010) present criteria for ensuring the quality of case study research. They highlight the importance of assuring validity and reliability of a case study and suggest

ways of how different aspects of validity and reliability can be operationalised. Table 13 shows the criteria suggested by Beverland and Lindgreen (2010).

Table 13: Quality Criteria for Case Research

Design Test	Generally operationalised Through:
Construct validity	1. Triangulation through multiple sources of data or interviews. 2. Providing readers with a chain of evidence using cross-case tables or quotes from informants. 3. Allowing interviewees to review the draft case and give feedback.
Internal validity	1. Pattern matching through cross-case analysis. 2. Searching for negative cases, ruling out or accounting for alternative explanations. 3. Time series analysis
External validity	1. Specification of the population of interest. 2. Replication logic in multiple case studies.
Reliability	1. A standardised interview protocol. 2. Constructs well defined and grounded in extant literature. 3. Providing an audit-trail by providing access to data.

Source: Beverland and Lindgreen (2010, p. 57)

Healy and Perry (2000) suggest comprehensive criteria to evaluate validity and reliability of qualitative research within the realism paradigm. These criteria are developed based on the each element of realism paradigm. As discussed in Section 3.2, there are various philosophical paradigms to research. Ontology (the nature of reality), epistemology (the theory of knowledge of the reality) and methodology (how the knowledge of the reality can be gained), are the elements of each paradigm. Realism paradigm explores multiple perspectives about a single reality (Healy and Perry, 2000). The case study method falls into the realism paradigm (Perry, 1998: Healy and Perry, 2000). The criteria suggested by Healy and Perry (2000) under the each element of realism and how these criteria are applied in a case research to establish trustworthiness is explained in Table 14.

Table 14: Trustworthiness for Research in Realism Paradigm

Trustworthiness criteria for each element of realism paradigm	Description of each criteria in terms of realism	Techniques in case study method to establish trustworthiness
Ontology		
1. Ontological appropriateness	Whether the research problem deals with a complex phenomenon in social science	Whether research problem being studied is how and why problem
2. Contingent validity	Validity about the social phenomena as an open system which involve contingent generative mechanisms of different contexts	Theoretical and literal replication, in-depth questions, emphasis on "why" issues, description of the context of the cases
Epistemology		
1. Multiple perceptions of participants and of peer researchers	Whether the researcher is value-aware (realists believe that there is a real world to discover even though it is imperfectly apprehensible)	Multiple interviews, supporting evidence, broad questions before probes, triangulation, self-description and awareness of own values. Published reports for peer review
Methodology		
1. Methodological trustworthiness	The degree to which the research can be audited by the use of quotations in the written report and developing a case study database	Case study database, use in the report of relevant quotations and matrices that summarise data, and of descriptions of procedures like case selection and doing interviews.
2. Analytic generalisation	Theory building rather than statistical theory testing	Identify research issues before data collection, to formulate an interview protocol that will provide data for confirming or disconfirming theory
3. Construct Validity	How well the constructs explained in the theory are measured in the research	Use of prior theory, case study database, triangulation

Source: Healy and Perry (2000, p. 122)

Researchers from different fields have written different views about quality criteria although they do not reflect a vast difference as discussed above. Pedrosa *et al.* (2012) presented criteria for ensuring the quality for case study research by analysing the quality criteria of the articles that were published in six leading logistics and SCM journals from 1998 to 2010. The three criteria of transferability, truth-value and traceability are the quality criteria recommended by Pedrosa *et al.* (2012) to ensure the rigour of case based research in logistics and SCM research. Transferability is the extent to which research findings can be applied to other backgrounds (Halldorsson and Aastrup, 2003) and it

acknowledges the impact of time on context and people that might affect the possibility of generalising the findings (Erlandson *et al.,* 1993). Truth-value is the match between the reality constructed by informants in their particular context and represented by the researcher (Lincoln and Guba, 1985). The proper documentation of research processes and data sources is concerned with traceability (Halldorsson and Aastrup, 2003).

The same criteria were used for this research as well as it is more relevant both in terms of the methodology and field of the present research. Table 15 presents these quality criteria with their indicators and how this research was planned to meet these quality criteria to establish the rigour of the research.

Table 15: Quality Criteria for Case Based Research in Logistics and SCM

Criteria	Indicators: information required to address the criterion	How this research will meet these criteria
Transferability	• Theoretical aim of the study • Unit of analysis • Justification of case selection • Number of cases used in study	These four indicators have been properly addressed and explained in this research (Respectively in Sections 1.6, 3.2.1, 3.11 and 3.12).
Truth-value	Description of data analysis process; • Categorisation (Coding) • Comparison • Iteration • Refutation	Coding process (Section 3.14 and 3.17) was explained in detail, comparing was done through cross- case analysis, The iteration process research went through was explained. Refutation was achieved through careful interpretation of case study evidence.
Traceability	Inclusion of case study protocol/database containing at least the following information: • Justification of informant selection • Number of informants • Description and/or inclusion of the data collection guide line • Description of changes in the research design made during the data collection process • Description of the used data collection techniques	The research design of this research is included and explained this information.

Source: Pedrosa *et al.* (2012, p.283)

3.7 Data Collection Methods

Data collection methods play an important role in ensuring validity and reliability of case study research. As in other field methods in case study research, data collection methods should not be separated from the research process (Yin, 1994). Six principal sources of

evidence have been suggested by Yin (1994) which possesses their own strengths and weaknesses. Although all sources are not essential in every case study, use of multiple sources enhances the reliability and validity of the research. Table 16 indicates the sources of evidence for case study research. Since each and every technique has unique strengths and weaknesses the use of multiple techniques helps to minimise the weaknesses of using single evidence.

Table 16: Types of Evidence for Case Study Research

Sources of Evidence	
Documentation	letters, memoranda, agendas, study reports
Archival Records	service records, maps, charts, lists of names, survey data, personal records such as diaries
Interviews	open ended, focused or structured
Direct Observation	formal or casual activities
Participant Observation	used in studies of neighbourhood, organisations and anthropological studies
Physical Artefacts	tools, art works, notebooks, computer output

Source: Yin (1994, p.80)

Interviews and analysis of company documentation were the main methods of data collection used for this research since they were the ideal techniques for exploring successful SCM strategies in Sri Lankan garment exporting SMEs and the barriers they face in implementing effective SCM strategies. As suggested by Yin (1994), the researcher collected the documents of company profiles, invoices, purchase orders, bill of materials, trim cards, technical specification sheets, measurement sheets, key performance indicator sheets, quality inspection reports, sample inspection reports, goods received notes, production plans, daily production amount sheets, line efficiency and defective reports, fabric clearance reports, packing lists, order confirmation sheets and fabric consumption approval forms of the selected garment exporting SMEs.

Both structured and semi-structured interviews were carried out with the senior managers of strategic, tactical and operational (purchasing or SCM) and managing directors dealing with suppliers and intermediaries and customers based on the prepared interview guides (Appendix A) so that more than one person from each firm was interviewed (see Sections 3.12.3, 3.13 and 3.16). Kvale (2010, p.9) describes the qualitative interviews as a "key venue for exploring the ways in which subjects experience and understand their world". Interviews can be conducted in different ways of face-face, over the telephone and using the internet however face-to-face interviews are the most common (Opdenakker, 2006).

This research also conducted face-to-face interviews due to its unique nature of ability to tape record (with the permission of the interviewee – see Section 3.13 and 3.16). Face-to-face interviews provide a platform to probe ahead of initial responses, avoid ambiguities and conquer any unwillingness to answer particular questions (Yin, 2003). The visibility of interviewee's social cues also facilitates the interviewer to decide the flow of the interview. The multiple sources of documentation and interviews were useful in gaining the knowledge of successful SCM strategies of Sri Lankan garment exporting SMEs.

3.8 Data Analysis

Tellis (1997) comments that, although various sources of evidence are available to collect data for case studies, analysis of collected data is one of the least developed facets of the case study method. Yin (1994) defines the data analysis of case studies as examining, categorising, tabulating or recombining evidence to address the initial research questions. He further states that since statistical analysis is not compulsorily used in case study data analysis, the researcher's experience and the extensive review of past literature play a major role in presenting evidence with valid and reliable interpretations. However, the literature discusses the different ways and means of analysing case study data. Miles and Huberman (1994) suggest the methods of: data reduction, data display and conclusion drawing and verification. The methods of pattern-matching, explanation-building and time-series analysis are presented by Yin (1994). Pattern-matching is comparing a predicted pattern with empirically gathered raw data. Eisenhardt (1989) also provides some guidelines for analysing case study data. She suggests the techniques of within-case analysis and searching for cross-patterns. The with-in case analysis provides the researcher with a comprehensive understanding of each case carried out as a separate entity. The cross case comparison is then carried out when rich familiarity of each is obtained. Trochim (1989) explains that pattern matching enhances the internal reliability of a case study and therefore it is one of the most advantageous data analysis strategies for case study researchers. Explanation-building is to explain the case as a way of analysing the case. Although this strategy is frequently used in explanatory case studies, it can be used in exploratory case studies as well (Tellis, 1997). Time series-analysis is done in experimental and quasi-experimental analysis when it can be identified as a single, dependent or independent variable.

However, the researcher should try as much as possible to ensure that data analysis is carried out carefully using all evidence collected throughout the case study (Tellis, 1997).

As recommended by Eisenhardt (1989) the data analysing techniques of within-case analysis, cross-case analysis and explanation building (Yin, 1994) were used to analyse the data for this research. Initially the data from each case was analysed independently in order to be familiar with the cases and in turn the cross-case analysis was carried out in order to seek the common patterns among them. Afterwards explanation–building was used to explain the case results as the researcher conducted explanatory case studies. However the whole process of data analysis was based on Miles and Huberman's (1994) three stages of qualitative data analysis: data reduction, data display and conclusion drawing and verification (see Section 3.14 and 3.17). Furthermore an effort was made to carry out supply chain mapping with each with-in case analysis and subsequently with cross-case analysis as well. Supply chain maps visually represent upstream and downstream flows of goods, information, processes and money throughout a supply chain (Roberts, 2003). It clearly shows the way a firm's supply chain is organised so that it facilitates identifying the impact of a business decision on the members of the supply chain.

When supply chain mapping is carried out with each individual case it will make cross-case analysis much easier and clearer (see Sections 4.2.1 and 4.3.1).

3.9 Case Study Research in SCM Research

Although quantitative methods have been widely used in purchasing, logistics and operations management, qualitative methods are now gaining increasing importance and acceptance as a feasible and valuable research method within these disciplines (Ellram, 1996). There is substantial potential for logistics research to use qualitative methods as well as other disciplines provided their applicability to the research questions (Mangan *et al.,* 2004). The case study method is an important strategy of conducting research in operations and logistics management (Stuart *et al.,* 2002; Voss *et al.,* 2002) and supply chain management (Hilmola *et al.,* 2005; Seuring, 2008). The case study method is widely used in SCM research to investigate intra- and inter organisational relationships (Yin, 1994).

Taxonomy of case study deployments in logistics research has been proposed by Dinwoodie and Xu (2008) based on the role of case studies in logistics research. For this purpose they reviewed the case studies conducted in logistics before 2008 and identified six classifications in terms of the characteristics and aims of research. Table 17 summarises the categories of different roles case studies have been played in logistics research. This categorisation is based on the characteristics and aims of research. It represents the popularity of case study methods in logistics research and also advocates validity as a good research strategy to confirm or challenge theories.Even though supply chain management go beyond logistics management the close relationship between logistics and supply chain management justifies the successful applicability of case study method in SCM research too. In supporting this Seuring (2008) confirms that case study method provides a flexible and customizable approach to conduct research in the subject of SCM.

3.10   Case Study Research in SMEs

The case study method has gained substantial interest in the methodological literature as a flexible research strategy (Eisenhardt, 1989; Gibb and Wilkins, 1991; Ragin and Becker, 1992; Stake, 1994; Gomm *et al.,* 2000). Along with the generic qualitative methodology, the case study method is gaining popularity and credence in small business research (Perren and Ram, 2004). Like many of the other disciplines social science also consists of subjective and objective perspectives (Burrell and Morgans, 1979). Perren and Ram (2004) argue that these objective and subjective perspectives are apparent in the literature of the case study method. The objective perspective is to examine the world as "if it were a hard, external, objective reality" (Burrell and Morgans, 1979, p.3) and subjective perspective is to "understand the way in which the individual creates, modifies and interprets the world" (Burrell and Morgans, 1979, p.3). The literature shows that the case study method has been used extensively in research done on SMEs (Patton, 2004). Further Patton (2004) developed a map of paradigms adopted by small business and entrepreneurial researchers by reviewing a range of papers that have used the case study method. He based their classification on two dimensions. First is the dichotomy between objective and subjective perspective as explained by Burrell and Morgans (1979). Past studies on small business and entrepreneurship either address the objective or subjective issues of organisations (Patton, 2004). Second is the boundary of cases. That is whether

the researchers have set boundaries around certain forms of "milieu of social factors" (social and cultural environment) or the individual "entrepreneur/owner/manager".

There is a wealth of recent literature that asserts the application of case study methodology under the paradigms explained by Patton (2004) in SCM related studies done on SMEs. For example case studies on managing and developing suppliers in SMEs (Williams, 2006), integrated strategic supply chain positioning for SMEs (Lim *et al.,*2006), managing the distribution channels in SMEs (Wagner and Alderdice, 2006), enhancing supply chain integration in SMEs (Campbell and Sankaran, 2005), SME's strategic supply chain decision (Wang and Fergusson, 2007), developing a strategic framework for efficient and effective optimisation of information in the supply chains of UK clothing manufacturing small firms(Adewole, 2005), SCM practices in Sri Lankan tea industry (Kohona, 2001), SCM practices in Cement industry of Indonesia (Padang, 2001), Automotive industry in Malaysia (Kamaruddin, 2001) and codes to coordinate supply chains: SME's experience (Ciliberti *et al.,* 2009).

Table 17: Taxonomy of Case Studies in Logistics Research

Category (Study Characteristics)	Purpose of the study
1.Exploratory studies of novel ideas or contexts	Aims to: Understand a particular process of specific contexts through in-depth study Derive tentative theoretical hypotheses Prototype an initial theoretical statement Investigate a novel industry, network or similar context
2.Validate studies	Aims to: Validate a model through an application within a positivist paradigm Validate a procedure or to differentiate between items within a positivist paradigm Illustrate the benefits of policy (cases as test markets) Guide case selection by specifying further cases of interest within a qualitative paradigm Identify and demonstrate further interesting cases
3.Studies to refine theory	Aims to: Refocus studies Analyse the dynamics of change Study the impacts of intervention and guide decision-makers
4.Studies to extend understanding and develop existing theory	Extend or develop theories relate to: Other sectors or criteria to guide strategy How implementation meet sector-specific characteristics, propose work to test for generic applicability or propose tentative theoretical statements The domain of an existing theory
5.Studies that examine multiple cases	Examine in situations where experimentation is invalid to: Identify differences in implementation in different supply chains, or industries Identify differing business characteristics Propose tentative theoretical statements of findings Propose a case for changing national policies

6.Reviews of multiple comparisons to develop extant theory to reveal extreme or unexpected cases in company size or positions in a supply chain	Aims to: Dissect published cases to establish guidelines for finding a crucial case, limiting conditions under which a hypothesis holds good, or the mechanism for achieving benefits Specify polarity using a comparator, or extremes and a typical or representative case, which may represent "good" practice

Source: Adapted from Dinwoodie and Xu (2008, p. 398)

The overarching aim of this research is to acquire knowledge of the current and successful SCM practices in the Sri Lankan garment exporting SMEs including the barriers to development. Achieving the aim of this research, contributes to the understanding of SMEs, as well as generating new knowledge regarding SCM practices within SMEs. Thus, the aims and objectives of this research fit within the fourth category: "studies to extend understanding and develop existing theory" (Dinwoodie and Xu, 2008, p. 398) in terms of the taxonomy presented in Table 17. The thesis develops existing theory relevant to SCM practices of exporting SMEs. Studies with a similar purpose can be found within the logistics and SCM literature. Peterson (2006) carried out a research to identify the logistics strategies adopted by a leading Danish transport and distribution company with a view to transfer the knowledge among other logistics and distribution companies in Denmark. Halldorsson and Skjott-Larsen (2006) studied the inter-organisational dynamics of the dyadic relationships between a buyer and provider of logistics services to improve the present understanding of dynamics of dyadic relationships based on a unique single case study in Denmark. Similarly Xiaofeng and Jianhua (2006) investigated logistics reconfiguration strategies and developed a logistics reconfiguration success framework based on Chinese pharmaceutical industry.

Seuring (2008) also highlights the value of case study methods in SCM research. He argues that since the complexities of supply chains make collecting data difficult, SCM researchers have to exert a massive effort to collect data from the several stages of supply chain. Therefore a customisable method of collecting data such as case study method creates a flexible platform to the researcher. Furthermore Seuring (2008) suggests, due to the inadequate explanation of the steps carried out in case studies of SCM research, this method has been criticised due to its lack of rigour. Thus SCM researches should

comprehensively provide information on case study design in order to improve validity and reliability of their research.

3.11   Case Study Selection Process

Before finalising the cases of this research, much consideration was given to the process of case study selection. Theoretical sampling is the most common technique in the selection of cases; while it is this type of sampling is not statistically-based, it does have a solid foundation in theory (Glaser and Strauss 1967; Eisenhardt 1989; McCutcheon and Meredith 1993). The case-based method creates the opportunity to search for novel findings; the random selection of cases is not necessary and also not recommended for a case-based methodology (Eisenhardt 1989). Therefore the selection of cases for this research was based on the theories of SCM (Section 2.4) and SMEs (especially Section 2.3.2) reviewed in Chapter 2; where they suggest that the chosen criteria are key aspects of effective supply chain management. The literature on the Sri Lankan garment industry (Section 2.2.8) and experts' opinions from preliminary data collection highlight the lack of direct contacts with buyers, low value addition and longer lead times as the main challenges to the garment exporting firms in Sri Lanka. Therefore having considered these three main issues and the purpose for the research (studying the successful SCM strategies) three criteria were developed to identify the SMEs that have implemented successful SCM strategies. The criteria consist of the three factors:

1. **Maintaining direct contacts with foreign buyers** (Kelegama and Foley, 1999; Kelegama, 2009) ,
2. **Shorter lead times**-time between receipt of the customer's order and the delivery of the goods(Tirimanne and Ariyawardana, 2008; Kelegama, 2009; Kelegama, 2005;Weerahewa and Ariyawardana ,2003) and
3. **Higher value addition of products per employee** (Kelegama and Epaarachchi, 2001; Thilakaratne, 2006; Kelegama, 2005)-Value addition of products per employee was judged through the turnover per employee and the range of products manufactured in a company.

The theories of SNT (Social Network Theory) and AT (Agency Theory) also suggest the importance of SCM as a network and principal and agent relationship. Therefore contacting buyers directly is significant to pursue a better business relationship in a

supply chain. These relationships then leading to various positive outcomes which are again different aspects of effective supply chain management such as information sharing, faster and mutual problem solving and cost savings that are leading to shorter lead times and higher value added (discussed in Section 2.2.10).

A list of registered SMEs under the Sri Lanka Chamber of Garment Exporters (SLCGE), the apex body for garment exporting SMEs, was obtained. The size of employment and annual turnover are the main features that SLCGE considers to define SMEs. According to SLCGE annual turnover should be ≤ 2.5 US dollars and size of employment ≤ 250 and it is compatible with the EU and UK definitions of SMEs in terms of the size of employment. In the first instance the chairman of SLCGE was approached over the phone when the purpose of the research and the criteria for sample selection of SMEs were explained in detail. The chairman of the SLCGE was considered an expert in the industry as he holds a leadership position and vast experience in the industry. There are more than 60 organisations that are registered with the SLCGE and the chairman recommended 15 companies which were doing well during the period of world economic recession. The managing directors and purchasing/logistics manager of each of these 15 SMEs were pursued over the telephone and the three initial screening questions about the lead time, direct contacts with buyers and turnover per employee were asked. However it was not possible to contact all 15 companies due to the obsolescence of the contact details provided in SLCGE registration list. Only three SMEs met the research criteria and majority were disqualified mainly due to them not having any direct contacts with the buyer. These companies coordinate with their buyers via local buying offices located in Sri Lanka. Another three SMEs were selected from the category which did not meet these three screening criteria. The three companies that met the criteria of shorter lead times, higher value added and direct contacts with foreign buyers (discussed in Section 2.2.10), were classified as 'more successful' and the other three that did not meet the criteria were labelled as 'less successful' companies. Therefore, in keeping with Stake's (2005) recommendation on sample size for case study research, the total of the six sample cases were selected as three from 'more successful' and another three from 'less successful' companies and was based on information-oriented case selection strategy (Vanwynsberghe and Khan, 2007). Information oriented case selection is appropriate when cases are deliberately selected for a special purpose (Vanwynsberghe and Khan,

2007) and the cases for this research were deliberately classified and selected to achieve the objectives of the research. Table 18 presents a summary of the chosen case studies for the research in terms of supply chain processes planned to study for the purpose of this research. The organisations will be anonymous throughout the thesis in order to ensure commercial confidentiality.

Table 18: A Summary of Chosen SMEs

	Case Study	Process focused on:
'More successful' firms	A	To understand short lead times, the direct relationships with buyers and the 'value addition' per employee
	B	
	C	
'Less successful' firms	D	To understand the obstacles that are encountered with decreasing lead times, improving direct relationships with buyers and improving the 'value addition' per employee
	E	
	F	

3.12   Overview of Case Studies

Table **19**19 provides a brief overview of each case participant. These data are obtained through the exploratory interviews carried out over the telephone with the owners of each chosen company and this helped to establish rapport with the interviewees which was thought be an advantage in future face-to-face interviews. Multiple case study designs are used when a comparison is needed between cases based on a theory (Yin, 2003). The 'more successful' and 'less successful' combination of selected SMEs facilitates the purpose of the research that is: to identify the successful SCM strategies and the barriers in improving them.

All of the chosen case studies are located in the western province of Sri Lanka as the nation's garment manufacturing industry is predominantly clustered in this area (as discussed in Section 2.2.6). The majority of SMEs, as well as large firms of the garment manufacturers, are established in the western province of the country due to the developed infrastructure facilities available in this part of the country. An overview of each company selected is given in Section 3.12.1 and 3.12.2.

Table 19: Details of the Selected Companies

	Case study	Direct contacts with foreign buyers	Annual turnover (in US dollar millions)	No. of employees	Product range	Value addition of products per employee in US dollars (Turnover/No. of employees)	Lead time (Days)
'More successful'	A	Yes	2.5	230	Low	10862	90
	B	Yes	2.2	140	Low	15714	30-90
	C	Yes	2.5	224	Low	11162	90
'Less successful'	D	No	1.1	129	High	8527	120-150
	E	No	1.5	200	High	7500	120-140
	F	No	1	123	High	8130	120-140

3.12.1 'More Successful' Companies

Companies A, B and C are considered to have short lead times, achieve relatively high valued and maintain direct contacts with foreign buyers; so these companies were identified as 'more successful' companies with the objective of understanding and identifying the factors that have contributed to their success. Therefore these cases were studied to understand how short lead times have been achieved, how direct relationships with buyers help optimise supply chain success and how relatively high value added per employee is achieved.

a) Case Study A

This case study, which falls within the 'more successful' category, was established in 2006 as the exporting arm of its mother company. While the mother company only catered to the local market, it diversified into the international market in 2006. The mother company has been in the apparel industry over 50 years. For the purpose of this research only the business operations of the export oriented company were considered as it is into the export market that the scope of this research falls. Case Study A has provided job opportunities for 230 employees with a turnover of 2.5 million US dollars so the value addition per employee in this company is 10862 US dollars. Its lead time is 90 days so it is capable of handling its manufacturing within 90 days or less at certain times. Manufacturing and exporting are the core business activities of Case Study A. It

manufactures only men's shirts and ladies' blouses with basic designs so its product range is low. It can manufacture within the fabric range of any types of checks, stripes, printed and plain material, woven, spandex, wrinkle free and wash garments as its machines are only flexible with these type of fabric types. The major foreign markets are the UK and USA but it also exports to India and Middle East countries as well. Around 55% of its products are exported to USA and 20% to the UK. It has direct contacts with its buyers in the UK and USA. The remaining 25% of products are sent to India and Middle East countries. The main brands manufactured are Lewi Phillip, Gap, Liz Claiborne and Fanoma. This Case Study manufactures its own brand especially for the UK market. The majority of the raw materials are imported from China and Thailand. Case Study A also works as a sub-contractor for a few major garment manufacturing companies in the country. Directorate includes a managing director and executive director.

Three interviews were carried with this case study: one interview with the managing director and one interview with the purchasing manager of export oriented company at the first stage of data collection and at the second stage of data collection process the managing director was interviewed again to collect missing information from the first stage of data collection. Purchase orders, production plan, product specification sheets, bill of materials, invoices, in-process inspection report, daily production status report, CAD system marker development sheets, trim card and company profile were the documents collected from this company.

b) Case Study B

This case study represents the category of 'more successful' firms in terms of the implementation SCM strategies. Case Study B was established in 1998 as a private limited company and currently its annual turnover is around 2.2 million US dollars. This Case Study employs around 140 people so the value addition per employees is 15714 US dollars. This Case Study manufactures fire resistant coveralls, overalls, tents, sleeping bags, knitted wears, uniforms for workers in hospitals, railways, security and fashion garments. The majority (80%) of its product range is industrial uniforms so the product range is low. The main export markets are Eastern and Western Europe especially the Scandinavian and Norwegian markets. Hilti, Jervan, Febi are its leading brands to its export markets. It is specialised in manufacturing technical and functional apparel products which are very practical in extreme weather and strenuous working conditions.

Manufacturing uniforms for the employees in the industries of hospital, railways and security is one of the main businesses in Case Study B. Case Study B can manage to manufacture uniforms within 30-60 days whereas manufacturing fashion garments requires up to 90 days due to the complicated nature of the designs.

Case Study B has been able to initiate and maintain direct contacts successfully with its foreign buyers. More than 70% of the raw material is imported mainly from China and Taiwan. Recently a reconfiguration process has been carried out as a part of agreeing to be a sub-contractor for an apparel giant in the industry.

The managing director and the purchasing manager of this case study were interviewed at the first stage of the data collection process and the managing director was again interviewed at the second stage of the data collection process so altogether three interviews were carried out from this company as well. The collected documents were international express airway bill, production plan, technical specification sheets, bill of materials, order confirmation sheets, inline quality inspection reports, accessories inspection reports, fabric inspection reports, lay plan for costing, invoices, pre-cost sheets, local purchase orders, sample plan, trim cards, end/mid line quality report, purchase orders and company profile.

c) Case Study C

Case study C is also a 'more successful' company. It was been founded in 1983 and presently employs 224 people with an annual turnover of around 2.5 million US dollars. The value addition per employee is therefore 11162 US dollars. Ladies' blouses, skirts and dresses are the main products of Case Study C. While most of its products are exported to the UK, some of the products are exported to Germany, Switzerland and Spain. It has been able to successfully establish direct contacts with its foreign buyers. C&A, Next and Debenhams are the main labels manufactured by Case Study C. China, India and Hong Kong are the main suppliers of raw material whilst local suppliers for thread can be seen. This case study source 100% of its fabrics from foreign suppliers and about 95% of them are from China. It mostly manufactures knit garments as they are compatible with its range of machinery and they are only ladies' blouses and dresses. Therefore the Case Study C also manufactures a low range of products. The relationship

with these foreign suppliers is strong as they have been dealing with them since long time. Unless the buyer has a nominated supplier they deal with their usual suppliers for sourcing raw materials. The lead time is ≤ 90 days and it mainly works on the buyers designs whilst occasionally it offers its own designs for buyers.

Three interviews were taken from this case study as well: one interview with the managing director and one interview with the purchasing manager at the first stage of data collection. The purchasing manager was again interviewed for the purpose of missing information collection at the second stage of data collection. Trim card, quality inspection report, invoices, purchase orders, CAD system grading sheets, marker development sheets, fitting comments reports and company profile were the documents received from the Case Study C.

3.12.2 'Less Successful' Companies

These are companies with longer lead times, lower value-added and for which contact with foreign buyers is via buying offices located in Sri Lanka. They are labelled as 'less successful' companies as these companies did not meet the selection criteria for this research. These cases were studied to understand the obstacles that are encountered with attempts to decrease lead times, develop direct relationships with buyers and improve value-added per employee. Such cases thus facilitated achieving the research objective of understanding the barriers to implementing effective SCM practices.

a) Case Study D

Case Study D began its business operations in 1985 but the current management assumed responsibility eight years ago. This case signifies the category of 'less successful' companies in terms of implementation of effective SCM strategies. This case study employs 129 workers and annual turnover is 1.1 million US dollars so the value addition per employee is 8527 US dollars. Its only export market is the UK. It does not have direct contacts with its buyer thus all the coordination with the buyer is carried out via the buying agent located in Sri Lanka. This case study's lead time is around 120-150 days however it varies depending on the order size. Ladies' garments, especially skirts, pants and blouses, are manufactured by this case study and the details of the orders including the design of the dress are received via email from the buying office. The range of products manufactured by this case study is higher than that of 'more successful'

companies. Fabric is always sent by the buying office and accessories are sourced both locally and abroad. It has to reject some orders it receives from local buying office due to the inflexibility of the machinery and some orders are completed at a loss.

Managing director and merchandiser were interviewed at the first stage of data collection process. The merchandiser was responsible for the management of purchasing, information transmitting, despatch of finished goods, finance management and etc. Due to the merchandiser's key role in the hierarchy of management, he was selected as an important interview candidate. The managing director is responsible for decision making and no managers are appointed to work under his authority. At the second stage of data collection process, the managing director was again interviewed to gather what was missing in the first stage of interviews. The documents of production plan, order placement sheets, daily output amount reports, key performance indicators reports, line efficiency and defectives rates reports, absenteeism records, purchase orders, goods received notes, invoices, cutting approval sheets, trim cards, order sheets, technical specification sheets, fabric clearance report, actual cost sheets and company profile were collected from the Case Study D.

b) Case Study E

Case Study E has been established in 1984 as a private limited company and illustrates the category of 'less successful' companies in terms of successful SCM strategies for this research. This case study manufactures 90% all kinds of ladies' wear and 10% is men's and children's wear thus possesses a higher range of products. The products are exported only to the UK; principally for Asda and Next. The annual turnover is around 1.5 million US dollars and currently 200 people are employed thus the annual turnover per employees is 7500 US dollars. This case study does not have any direct contacts with its buyers and totally depends on the local buying offices of its foreign buyers.

Raw materials are sourced both locally and internationally. Fabric is imported from the foreign suppliers nominated by the buyers. More than 70% of the raw materials are sourced from foreign countries and mostly accessories are purchased within Sri Lanka. The designs of the garments are always from the buyers. The average lead-time of this company is 120-140 days. However the lead-times vary depending on the size of orders.

The managing director and merchandiser were interviewed at the first stage of data collection. Merchandiser was selected as an interview candidate as he was responsible for purchasing management. The managing director was interviewed at the second stage of data collection process totalling the number of interviews at three. Only a few documents were collected: quality inspection report, daily measurement report, and defect analysis report and company profile. Neither the managing director nor the merchandiser was willing to pass on much documentary evidence.

c) Case Study F

Case study F also represents the category of 'less successful' companies and it manufactures ladies', gents' and children's knitwear so again it also possesses a higher range of products. The case study was founded in 1991 and exporting garments started in 1992. It employs 123 people and annual turnover 1 million dollars so it makes the value addition per employee 8130 US dollars. The majority of which is around 85% of its products are exported to the European countries of Netherlands, Ireland, Germany, Holland, Italy and the UK. The remaining 15% is sent to USA. Mantis World, Next, Lea sportswear, White, Zeeman, Protex are Texunion are this company's brands. Designs of the garments are always sent from the buyer. The average lead-time of this company is around 120-140 days. Fabric comes from the buying offices and they are imported from India, China, Indonesia, Korea and Pakistan. There are some occasions when Case Study F has to refuse some orders as it does not possess all the required machinery and the high cost of investing in additional plant. The organisation chart of the case study shows a very top down management and production manager, import export manager and accountant are the immediate layer down to the directorate.

This is a family-owned company with a husband and wife as the managing directors. The husband is the managing director for marketing and administration whilst his wife is the managing director responsible for production. Therefore both the managing directors were interviewed at the first stage of data collection and only managing director (production) was interviewed at the second stage. Purchase orders, list of machinery, organisation chart, factory images, invoices, packing lists, shipment declaration forms and company profile were the documents collected from this company.

3.12.3 Case Study Questions

The overarching aim of this research is to identify the successful SCM strategies being implemented in garment exporting SMEs in Sri Lanka. In order to achieve the aim of the research three criteria were developed and cases were screened for the research using these criteria. Two generic interview guides (Appendix A) were developed and were loosely structured around these three factors and divided into three sections: lead time related, value addition related and direct contacts related. The two generic interview guides are more or less similar to each other except in the section related to direct contacts. The underlying reason for this is three of chosen companies have direct contacts with their foreign buyers whereas other three do not so necessarily this section had to be different to each other. The all the questions in the interview guides were based on the rigorously reviewed prior theory (Appendix B) that are discussed in Section 2.2.10 and the inputs obtained from the exploratory interviews initially carried out over the telephone with the owners of selected SMEs. Nair and Riege (1995) highlight that exploratory interviews with experts at an early stage of qualitative research provides useful insights into the direction of the research while prior theory related to the problem is being reviewed. The basic contextual questions of each chosen company were asked at the initial exploratory interviews had over the telephone and therefore those were not pursued in the interview guides. At the beginning of the interview guide, the researcher was introduced and the purpose of the research was explained in detail along with important ethical considerations outlining the rights of the interviewee. The main sections of the interview guides are now outlined;

Lead time related: The first section of questions was regarding the lead time of each company and the researcher's definition of the term "lead time" was explained clearly before proceeding with questions. A number of factors affecting the lead time of a manufacturing organisation were evident from the literature (see Section 2.2.10) and the initial exploratory interviews: the techniques use to manage the relationships with the buyers and suppliers, the strategies for coping with uncertainties arisen from the internal and external business environments, manufacturing techniques used and strategies to manage the relationship with factory and management. Questions reflecting these factors were included in the first section of the interview guides.

Value addition related: The second section of the questions included the questions related to the factors affecting value addition of the products in a manufacturing organisation. These factors were clearly discussed in the literature review (see Section 2.2.10) and there was some literature available especially related to garment manufacturing organisations (see Section 2.2.8). In this section questions reflecting the range of products manufacturing, logistics and transport costs, new product development process and cost, productivity of employees, customer order path and quality of the products were included.

Direct contacts related: This is the last section of the questions and this was different for the companies which have direct contacts with its foreign buyers and which have not. The questions indicating the factors of reasons (see Section 2.2.10) as to why these companies prefer to have direct contacts with buyers and the techniques of managing the direct contacts with buyers were included in the interview guide prepared for the companies which have direct contacts with its foreign buyers. The reasons behind the difficulty to manage direct contacts are mainly pursued in the interview guide aimed at companies which do not have direct contacts with foreign buyers.

However a clear demarcation between the sections of the questions was impossible to maintain as certain questions were reflecting more than one section of the questions. McCracken (1988) stated that data ordering of an interview guide must not destroy the freedom and variability within an interview. In such circumstances those questions were included only once and not included in any subsequent sections to avoid duplication of data. This prevents the interviewee neither redirected nor interrupted so the flow of the interview will not be disturbed. King (1997) suggests that loose structure for the interviews optimises the flexibility interviews. An overview of the interview guide is given in Appendix A.

3.13   Conducting Case Studies (Stage 1)

Even though the researcher planned to conduct all of the interviews, time and finance dictated that an experienced researcher in Sri Lanka be employed for this purpose; the interviewer was selected based on his interview skills and knowledge of the research topic. The interview guides were carefully structured with major themes and the anticipated cross questions were included under each major theme. A description of

possible answers for the questions along with the instructions were mentioned clearly wherever relevant so that the interviewer was able to easily decide which questions were appropriate to ask depending on previous responses. The technical terms and theoretical concepts were outlined in detail for minimising the possibility of participants misinterpreting key issues and so they did not feel uncomfortable with over-complicated terms. Each question in the interview guide was explained to the interviewer over the phone and the interviewers doubts were clarified clearly.

Twelve carefully-organised interview guides were sent to the interviewer by email because it was planned to interview two senior employees from six companies. Interviewing managing directors was considered to be important to facilitate further access and co-operation and also to gain the validity for the research as finding a gate keeper supports in gaining local permission reaching the participants (Creswell, 2013). At the same time purchasing or logistics managers are the responsible authorities for the total supply chain of an organisation so it is vital source information for the research. Miles and Huberman, (1994) suggest that identifying the interviewees who can best answer the interview question is important to obtain high quality data. However the researcher was able to find out from the initial exploratory telephone interviews that Case Study D and E (those which have indirect contacts with their foreign buyers) did not have purchasing or logistics manager and merchandiser was the designation replaced this position. Therefore instead of purchasing or logistics manager, it was decided to interview merchandisers from these two companies. Similarly, Case Study F also did not have purchasing or logistics manager because this is a family owned company run by a husband and wife team as managing directors. One of them is responsible for marketing and administration while the other handles purchasing and production operations so it was decided to interview the managing director of production and purchasing from Case Study F as a replacement of purchasing or logistics manager. The details of these people were obtained well in advance over the initial telephone conversations had with managing directors of the chosen companies.

As per the interview guide recommended by Creswell (2013), each generic interview guide included the name and designation of the interviewee and name of the company depending on whether it is a company which have direct contacts with its foreign buyers or not. This was done to prevent any mistakes probable by the interviewer. However a

pilot interview was carried out by the interviewer to fine tune the interview guide. Pilot testing refines the interview questions and improves the interview procedures (Creswell, 2013; Yin 2009). Once the interview was finalised the interview recording was emailed and the researcher carefully listened to the record in order to identify any confusion in the interview guide. On the whole, the interview guide did not include unclear questions except a few technical terms and they were rephrased for subsequent interviews. Pilot studies are preferred before the major data collection phase however they should not be treated as pre-tests or rehearsals of the interview guide (Yin, 1994). The necessary changes were done in the interview guide and sent off to the interviewer in order to proceed with the rest of the interviews.

The interviewer proceeded with the remainder of the interviews and audio recordings were emailed as soon as the interviews were conducted for immediate, *verbatim* transcription in Nvivo 10. The researcher found transcribing easy in Nvivo 10 as it was very time-efficient. One company, one of the ones without direct contacts with foreign buyers, was dropped in the middle of data collection process as the managing director was not willing to disclose any information further. The researcher was able to replace this company with another similar company which was found through the SLCGE registered list of SMEs. While the trained interviewer was carrying out the interviews the researcher contacted the new company and explained the purpose of the research so later on the interviewer found it easy to approach this company. The interviewer was able to complete the twelve interviews which took place in Sri Lanka within about 4 months and the researcher personally contacted the interviewees from time to time to ensure that they were still happy to participate in the research. This approach facilitated the research and enabled the interviewer to access these companies and obtain appointments for interviews. Interviews were conducted in the work place and lasted between one and one and half. Majority of the interviews were carried out during morning sessions, except two interviews as it was more convenient to the respondents. When all the interviews were completed, thank you letters were sent to each participant.

3.14 With-in Case Analysis

Once the interviews had taken place, transcribing took place by the researcher as it was considered that this was important especially when the interviews were conducted by another party. Frost and Stablein (1992) mentioned this as "handling your own rat" as

transcribing one's own data helps to build knowledge of the data and saves the time incurred in editing the transcriptions done by another person. It helped the researcher gain familiarity with the content of interviews. Further to this, it facilitated the understanding of the data obtained from initial exploratory telephone interviews. Interview transcriptions were sent off to the companies to reassure the confidentiality of data obtained and also as measure of reliability of the information (Beverland and Lindgreen, 2010). Afterwards the completed transcripts for each company were read thoroughly through to identify the broad themes and patterns pertaining to research questions.

The themes and patterns were mainly organised under the criteria of considered to choose the case studies for the research: lead time, value addition and direct contacts related. As they were identified, tree nodes were created in Nvivo10: parent nodes for lead time, value addition and direct contacts related factors and child nodes for themes and patterns emerged under the main themes. A tree node is a structure where a parent node connects all the concepts denoted by its child notes. Dey (1993) explains that classifying concepts assigns meaning to them. This research involves a combination of priori, or theoretically derived codes (Bazely, 2011) and in vivo or indigenous codes (Strauss, 1987). The parent nodes and some of the child notes were based on reviewed literature, which are theoretically based where as some other child nodes such as small quantity orders and business risk diversification were derived directly from the data collected so concepts to explore further were clear at the beginning of data analysis which facilitated the tree nodes creating process. Tree nodes created were a simple two levels structure as illustrated by Miles and Huberman (1994): a more generic "etic" level and a more specific "emic" level and emic nodes are contained in the etic nodes. Coding was done whenever relevant lines or chunks of information found relevant to each main node and sub nodes created. Once coding was completed under main and sub nodes for each company they exported to word documents so all the information related to each company was visible together.

The collated information under each theme and pattern for each company was read carefully as a preparation of carrying out the with-in case analysis. Subsequently the single case reports entailing an overview of the company and the approach to supply chain management in terms of identified broad themes pursued through the interview questions were prepared. These case reports were sent off to each relevant company as a

measure of validity of gathered data. None of the companies responded with anything relating to the interview transcriptions. However two companies wrote back commenting on the case report and certain information was modified accordingly. Another three companies acknowledged the receipt of the case reports and nothing was heard from the remaining company. With-in case analysis reports were supportive in further improving the familiarity with both of the companies and interview transcripts. It also assisted in identifying the issues would be further explored. As a result of this, the data were recognised to reflect the importance of the role played by the local buying offices of foreign buyers with regard to the companies who do not have direct contacts with its foreign buyers. And also with-in case analysis reports were the base to figure out the missing information to achieve the objectives of the research which leads to a second stage interviews.

3.15   Preparation for Conducting Case Studies (Stage 2)

The literature about the Sri Lankan garment industry (see Section 2.4.8) mentions that buying offices play a key role in selecting appropriate suppliers from Sri Lanka and supplying raw materials to SMEs. However the real significance of the role played by buying offices in terms of logistics operations in the supply chain of the companies which do not have direct contacts was not convinced until it was highlighted by the with-in case analysis reports so it was considered that it is worthwhile to interview buying offices to unveil any important information. A semi-structured interview guide (Appendix C) was prepared mainly based on the findings of the with-in case analysis and relevant literature such as trust and information sharing in the supply chain of the buying offices. Interview guide was semi-structured because the researcher personally plans to conduct the interviews in Sri Lanka. Semi-structured interviews guides were also prepared to follow up the missing information with relevant to each company and these interview guides were different to each other as information required was also different from each company. Managing directors, purchasing managers and merchandisers whom already were interviewed at the first stage interviews were again contacted over the telephone and informed that their help will be needed further to obtain some more information. The researcher did not have personal access to buying offices so in that case managing directors of two of the companies that work with buying offices were the referrals of three buying offices that they are working with. Snowball or chain referral sampling method is

widely used in qualitative research especially when the knowledge of the insiders of specific problem needed to locate the other people who might be of research interest (Biernacki and Waldorf, 1981). The managing directors of these buying offices were again contacted over the telephone and it was explained how the contact details were obtained and why they were contacted in terms of the objectives of the research. Two of them agreed to help while the other one did not express an interest so it was decided to interview the managing directors of these two companies. The interviewees from buying offices were e-mailed again to guarantee their co-operation prior to the researcher travelling to Sri Lanka to collect the data.

3.16 Conducting Case Studies (Stage 2)

The communication with the anticipated interviewees was initiated over the telephone to obtain the appointments for the interviews as early as possible once the researcher travelled to Sri Lanka. The researcher planned to spend six weeks in Sri Lanka for data collection; participants were informed of this time limitation. The rapport was already established by previous telephone conversations which proved very helpful in collecting the data, including follow up interviews from the chosen companies and interviews from two agreed buying offices within a short time period of six weeks. The managing director or merchandiser/purchasing manager were interviewed depending on whoever was available to offer an appointment. Surprisingly managing directors from five companies offered appointments whilst the purchasing manager from other company was interviewed. All the interviews were recorded on the dictaphone and the mobile phone and any important information also were noted down to minimise the risk of losing data. As every interview was completed the researcher listened to the recording in preparation for the next interview which helped to probe more information in the subsequent interviews. The basic questions were probed at the beginning of the interviews as the researcher thought such questions would be useful to "warm-up" the interviewee and subsequent questions were more formal and towards the supply chain aspects of the company. Cross questions were always asked as new knowledge emerged from the interviewees' answers and when and where more clarification was needed. The copies of the interview recordings were saved at different locations of the computer and they were emailed to the researcher's own email account as a protective action to preserve the collected data.

Apart from the interviews, another purpose of this visit was to collect documentary evidence from the chosen companies. Company profiles, invoices, purchase orders, bill of materials, trim cards, technical specification sheets, measurement sheets, key performance indicator sheets, quality inspection reports, sample inspection reports, goods received notes, production plans, daily production amount sheets, line efficiency and defective reports, fabric clearance reports, packing lists, order confirmation sheets and fabric consumption approval forms were collected from the companies. The same documents from each company were not able to be collected however the majority of them were very similar. It was difficult to convince participants about the requirements of the documents at the beginning but when the researcher ensured that these documents only will be used for the purpose of the research, the confidentiality of data will be preserved and any financial or confidential data will not be needed, participants were more amenable to provide the documents. However one company did not cooperate like other companies so only a few documents were received from this company compared to the rest of the companies. Initially the plan was to collect annual reports and meeting minutes as well but they were refused by the managing directors due to the confidential data contained in them. The documents were photocopied at the companies and some of them did not mind releasing the originals. One buying office provided documentary evidence for the compliance audit it carries out to select the factories for its orders and the managing director of the other company did not provide any document but he was afford to provide a comprehensive interview. Travelling from one company to another was manageable since all the companies were chosen from the western province of Sri Lanka.

3.17   Cross-Case Analysis

Transcribing is an essential step in qualitative data analysis. Kavle (2010) states that transcribing interviews from verbal to text facilitates the closer analysis as transcribing itself is an initial stage of data analysis. As the interviews were transcribed *verbatim* in Nvivo 10 they were exported to word documents and read thoroughly again and again so the transcriptions provided clear and accurate data. Interview transcriptions were sent back to the interviewees to reassure the confidentiality and ensure the reliability of gathered data but respondents did not turn up with any amendments to the interview transcriptions.

The documents collected were organised in terms of the research questions and analysed by the researcher. All the documents were scanned and imported into Nvivo 10. Every document was read through carefully to filter relevant data; important data that either supported or contrasted the interview data were then annotated within Nvivo 10 for subsequent analysis. There were some data that reflected new aspects of the supply chain that were not apparent in the first or second stage data such as the actual number of documents a company has to exchange with buying offices and how long lead times were explained. Once documentary analysis was completed, with-in case analysis reports prepared on the basis of first stage interviews and second stage interview transcriptions were read together to facilitate further the familiarity with the new information gathered. This time it was apparent that data collected from two buying offices were supporting and also contrasting more of the data collected from the companies which do not have direct contacts with their foreign buyers. Afterwards additional recoding were added to Nvivo 10 with new data that originated from the second stage interviews and documents annotations so some more data statements, chunks and phrases were added to some of the nodes and a few new sub-nodes also were created: barriers to improve lead time and barriers to improve value addition of the products. Recoding was a little complex due to the large amount of data emerged with the second stage of data collection as with two buying offices it collated data from eight cases whereas before it was only six cases. Once the recoding process was completed these individual reports under each main node were exported into MS Word and printed so all relevant data was visible from first stage interviews, second stage interviews and documentary analysis under each theme in a single report. This facilitates updating the with-in case analysis reports to certain extent irrespective of the large amount data available under each theme.

Updated with-in case analysis was then read several times tracing back to the interview guides and documentary analysis when necessary in order for the preparation of cross-case analysis; as recommended by Miles and Huberman's (1994) analytic framework of qualitative data analysis: data reduction, data display and conclusion drawing/verification. With-in case analysis reports were prepared with reduced data to some extent. However as an effort for further data reduction nodes were reorganised and six *a priori* based parent nodes were created (see Section 2.2.10); barriers of: 1. lead time, 2. value addition, 3. direct contacts and successful practices of 4. lead time, 5. value addition and 6. direct

contacts. Data coding can be inductive, deductive or a combination of both (Miles and Huberman, 1994) and new theoretical knowledge can be generated without application of prior disciplinary knowledge (Coffey and Atkinson, 1996) so coding for this research was a combination of both inductive and deductive. Whilst the reorganisation of nodes enabled to further distil the coded data it was more aligned with the objectives of the research as well. After having been through updated with-in case reports many times finally the sub themes were distilled from the data under the main themes already identified. During this stage it was required to cross reference the information many times with the original interview transcripts and reviewed literature. Some of the original sub themes were aggregated and converted to broader sub theme and some of new sub themes were also introduced during the phase of nodes reorganisation. Recoding was done to fit in with new nodes structure (Appendix D). Data from first stage interviews, second stage interviews and documents were coded as and when they became relevant to each nodes created. Upon the completion of data coding the ground work for subsequent analysis was available.

However without the creation of attributes for each case study, the comparison of case studies based on the identified themes and patterns would not be possible. A node classification was done as a result and case study name, range of products, 'less successful' or 'more successful' and type of the case study were the added attributes (Appendix E). Then matrix queries were run for the attribute of case study name under each parent node including the child nodes. The matrix queries were based on coding references count so coding references count for each case study under each child node were clearly visible and the same could be displayed in the graphs providing the researcher an idea as to which themes and patterns are more prominent than the others. Matrix queries were repeatedly run for each parent node to ensure that the research questions will be addressed to the point. A matrix query was then run for each case study under all the parent nodes with the objective of achieving a better understanding of standing of different themes from different case studies. It was ensured that parent nodes were aggregated before running the matrix query for parent nodes. Cross-case analysis always involve matrix coding queries as it easily allows comparing the case evidences with different attribute values (Bazeley, 2011). Further the filter options in the node matrix tables immensely aided in determining which case has equal, less or greater than

number of coding references in comparison of another case. Comparing the 'more successful' and 'less successful' companies to find out more prominent themes and patterns in each case was more easily carried out with the filter options in node matrix tables. Group queries also carried out to see how coding references are associated with source data providing an opportunity to see the replication of same pattern or theme from different sources (Appendix F). Advanced coding queries for different combinations of aggregated parent nodes for both successful SCM practices and barriers to implement effective SCM strategies also were carried out to understand what factors are in common under these different parent nodes. This facilitated in identifying common factors that can be affected more than one criterion employed for this research (lead time, value addition and direct contacts). These techniques to explore the gathered data enabled data display which corresponds to Miles and Huberman's (1994) data display stage.

Including the quotations considered to be important and only the quotations particularly illuminating or seemed representative of a phenomenon were included.

Case studies, in terms of time period, eventually ended up as multiple time periods case studies as two rounds of interviews were carried out in Sri Lanka at two different times and initial telephone interviews as well (November 2011- March 2012 and July-August 2012).

3.18 Ethics and Confidentiality

Confidentiality and anonymity were guaranteed to the interview participants so to facilitate the disclosure of the required information. It is an important component of qualitative research ethics that the research participants should be informed about ways and means of anonymisation (Oliver, 2003). In initial approaches to the companies it was stressed that the data collected will only be used to the purpose of the research and they will be not passed to any third party and also confidential and financial data will not be requested. Before conducting every interview the research and researcher were introduced and their rights as an interviewee also were explained so they were aware that they could withdraw from the interview at any time. Prior to conduct an interview interviewee's informed consent to participate should be obtained (Kvale, 2010). Permission was sought before recording the interviews. Even though none of the companies asked for the interview transcriptions or with-in case reports the researcher sent them to relevant

companies. Kvale (2010) explains that as a matter of good ethical conduct, the researcher should ensure that transcriptions are consistent with interviewee's oral statements. However except for two of them, all participants did not ask for any parts to be added or omitted. The researcher was careful to exclude any information that makes any company or respondent identifiable especially from the context information. Any reference made to any individual's opinion by job tittle and the quotations were removed in the with-in case analysis before sending them off to the participants.

3.19 Summary

The case study method is commonly used to study a particular situation, event or process in depth. Also it can be used when investigating entirely new phenomena or areas where sufficient literature is not available (Eisenhardt, 1989). In previous literature it is evident that the case study method is a popular research method in SMEs and SCM discipline in different industries. For example the cases carried out on SCM related issues in SMEs from different industries such as clothing industry (Adewole, 2005), furniture industry (Williams, 2006), tea industry (Kohona, 2001), automotive industry (Kamaruddin, 2001) and cement industry (Padang, 2001). In this chapter, theoretical evidence was provided to substantiate the application of the case method using qualitative-based, structured/semi-structured interviews to collect data. Initial telephone interviews were conducted followed by face-to-face interviews and the interview data were supported by a review of documentation produced by and about the companies chosen to study. This chapter has outlined the procedures undertaken to carry out the case studies in Sri Lanka and why interviewing buying offices were in need as a result of first stage interviews so this was unable to anticipate at the first time. A case study protocol can be written in an orderly progressive way but this is rare in practice (McDowell, 1998). As long as the changes to the planned data collection protocols are acknowledged by the researcher the validity of the findings will not be diminished (Ellram, 1996). Finally it was explained that data analysis procedures and different approaches undertaken to assure confidentiality and maintenance of research ethics throughout the research procedures.

Chapter 4. Findings

4.1 Introduction

The overall aim of this research was to explore the current, successful SCM practices of SMEs in the Sri Lankan garment manufacturing and export industry. As outlined in Chapter 3, the case study method was identified as the most suitable for achieving this aim. In this chapter, findings of interview and documentary data analysis are presented. Section 4.2 presents the successful strategies implemented by Sri Lankan garment industry SMEs including: i) lead time; ii) value added; and iii) direct contacts. Section 4.3 explains the barriers to improving existing SCM strategies using these same category headings.

Lead time, value added per employee and whether the companies maintain direct or indirect contacts with their foreign buyers were the three criteria employed to determine the successful implementation of SCM strategies by garment manufacturing and exporting SMEs in Sri Lanka. SMEs with shorter lead times and higher value addition per employee that maintain direct contacts with their foreign buyers were defined as 'more successful' companies and SMEs with the opposite factors were considered as 'less successful'. The case studies for this research were chosen based on the information-oriented case selection strategy (Vanwynsberghe and Khan, 2007) and three SMEs were available with required data from each two categories of 'more' and 'less successful' companies. Two local buying offices were also chosen to explore the key role they play as was evident through the initial six case studies carried out. Therefore the interview guide was organised around these three factors; those which facilitated the organisation of themes and patterns that emerged during the stages of data analysis. Hence, the themes and patterns that emerged have been organised on the factors of lead time, value addition and the presence/absence of direct contacts with the foreign buyers and thus the findings are presented in the order of the research questions: the successful SCM practices of garment manufacturing and exporting industry SMEs in Sri Lanka and the barriers faced by these SMEs to implement successful SCM strategies. The final objective (that the factors which facilitate the efficient functioning of effective SCM practices in a garment manufacturing and export SME) is addressed in the discussion chapter as achieving this objective needs evidence from the literature along with the findings of this research.

Moreover an effort has been made to develop generic supply chain networks for both 'more' and 'less successful' companies.

4.2 Successful SCM Practices

The matrix queries run with the interview data and documentary evidence revealed themes and patterns of successful SCM strategies of garment manufacturing and exporting SMEs in Sri Lanka under the three factors of lead time, value addition and direct contacts related. They are summarised and presented in a model related to each of the key success factors in Figure 14. These three factors were theoretically derived from the literature (see Section 2.2.10). However, additional inductively derived themes of strong business network, improved profitability and business risk diversification, emerged as in-vivo codes. These are now presented with the aid of matrix coding queries run in Nvivo 10.

4.2.1 Successful SCM Strategies in Relation to Lead Times

A matrix coding query was run for the child nodes created under the parent node of lead time related successful strategies. The nodes matrix table (Table 20) clearly shows the number of coding references from multiple sources of evidence (interview transcriptions and documents) made under each theme and pattern for each case carried out. There are eight cases in total here with the two buying offices studied in the second stage of data collection. Eight cases were classified in Nvivo 10 with their characteristics and the classification sheet provides a clear summarised view of each case in terms of their characteristics (Appendix G). Case study A, B and C are from the 'more successful' category and D, E and F are from the 'less successful' category. Eight themes and patterns were identified under the main theme of lead time related successful SCM strategies: effective cell layout and operations planning, effective information management techniques, high emphasis on team work, implementation of CAD,CAM and RFID, implementation of 5S, relatively shorter supply chains, strong mutual understanding in the supply chain and successful uncertainties management. The relationship between the main theme and sub-themes are also presented in a model developed in Nvivo 10 (Appendix H). It can be seen from Table 20 that lead time-related successful strategies have not only emerged from the data from 'more successful' companies but from the 'less successful' companies as well. However most of the coding

references are apparent from 'more successful' companies. Each sub-theme and pattern that emerged under the main theme of lead time-related strategies is discussed in turn with the evidence provided from the case studies (data from interviews and documents).

Figure 14: The Indicators of Successful SCM Strategies
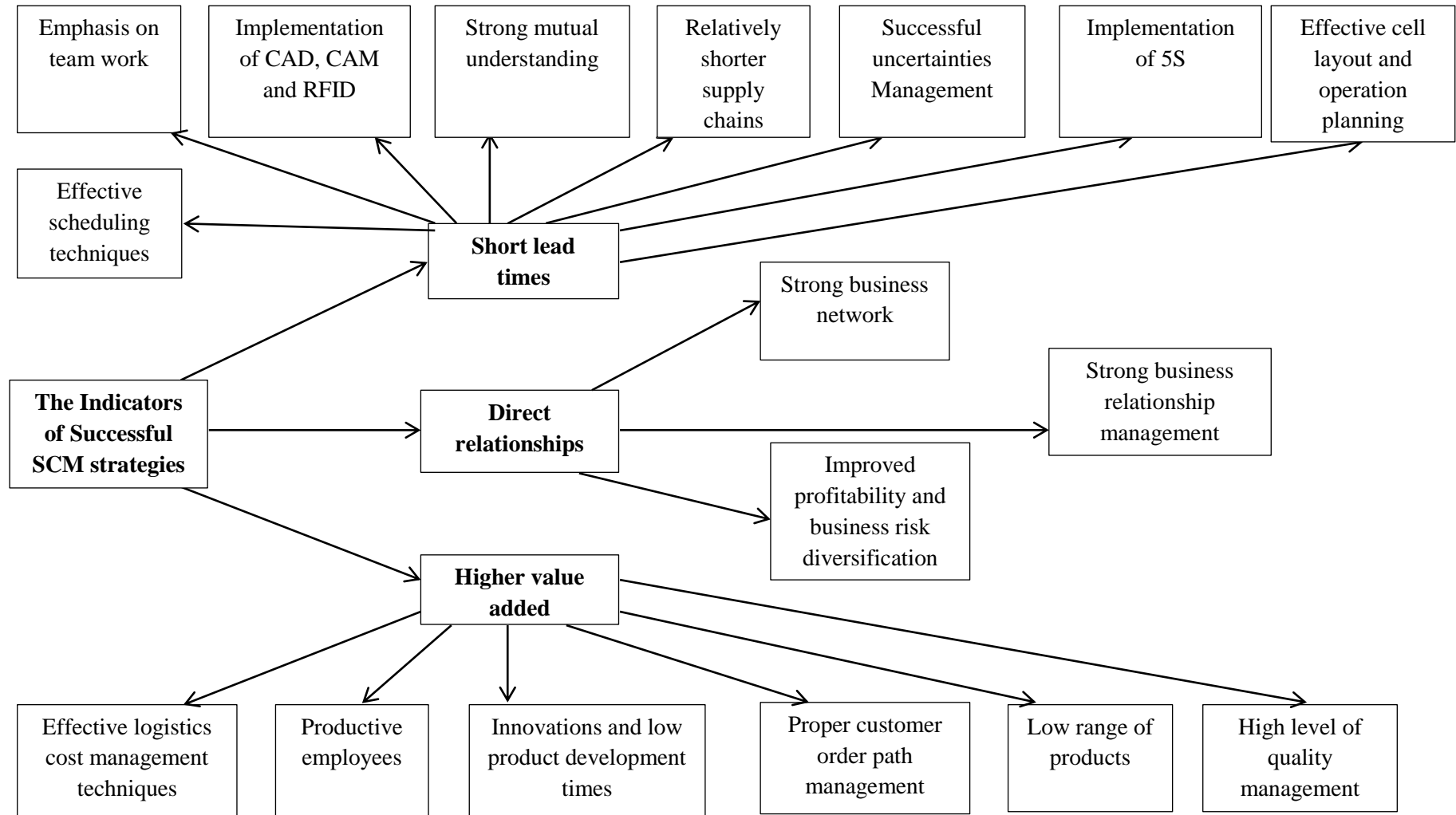
Table 20: Node Matrix-Lead Time Related Successful SCM Strategies

	Case A	Case B	Case C	Case D	Case E	Case F	Case 1-Buying office	Case 2-Buying office
1 : Effective cell layout and operations planning	3	5	2	6	5	2	0	0
2 : Effective information management techniques (ERP, MRP)	5	2	3	0	0	0	0	0
3 : High emphasis on team work	2	2	2	0	3	2	0	0
4 : Implementation of CAD, CAM, RFID	3	3	2	0	0	0	0	0
5: Implementation of 5S	3	1	0	0	0	1	0	0
6 : Relatively shorter supply chains	3	4	4	0	0	0	0	0
7 : Strong mutual understanding in the supply chain	7	10	6	2	3	5	0	2
8 : Successful uncertainties management	7	8	9	10	10	9	0	0

a) *Effective Cell Layout and Operations Planning*

The theme of effective cell layout and operations planning was more prominent from the 'less successful' companies, as determined by comparing the content of the (n=10) coding references from the 'more successful' with the (n=13) coding references from the 'less successful' companies (Table 20).

Not all companies have a fixed machine lay out and it is only set upon receipt of an order that machinery layout is configured because each design needs a different layout to attain the maximum efficiency. Manufacturing operations are run on a line system to improve efficiency:

> "...we have done it in a line system to improve the efficiency" (Purchasing Manager-Case Study A).

When an order is confirmed a pre-production meeting is held to discuss every issue related to the new order; machine layout was one of the important factors which was discussed. Also, in the sample run which is a small scale production, it is possible to detect any improper positioning of a machine as a contingency for the actual production run. The different viewpoints from quality controllers, supervisors and mechanics are considered before finalising the best machine layout:

> *"Pre-production meetings, where the technician, the production staff, quality controllers and supervisors meet and plan the garment to see the number of operations manufacturing a particular type of garment is needed, then the machine layout is done accordingly to see if any issues are coming up with the garment, it can be cutting, production or whatever so the machine layout is done on a pre- production" (Managing Director-Marketing and Administration- Case Study F).*

Pre-production meetings have been largely helpful in minimising the time wasted when changing existing machine layout to a new:

> *"We study the [machine] movements and decide the sequence of the operations at the pre-production meetings and set the machines accordingly. What we do is when one design is about to finish the mechanics start getting ready with the machine layout for the next design so the machines at the beginning of the line will be changed and repositioned and it saves our time" (Managing Director- Case Study D).*

The management of each company has its own procedures to update themselves on an hourly or daily basis with regard to production statuses at the factories: physical visits to the factory, daily reporting structures of formats and forms and hourly production rates displayed on white boards. In situations when bottlenecks appear the management immediately attend to solving them to ensure minimum time is lost in the process of manufacturing:

> *"The layout keeps moving the materials and it's all done by manually so if there are inefficient persons in between although majority are efficient there will be bottlenecks and also if there is inefficient equipment then again*

bottlenecks will come up so our supervisors will keep on watching in order to stop those conditions so we will fix them immediately to minimise the time loss" (Managing Director- Case study B).

Moving from one design to another does not cause delays since it takes place within one day. However, a time lag is experienced as sewing staff familiarise themselves with new designs to reach the peak of daily production. With a lower range of products, less time is taken to change the machine layout:

"Since we are making shirts we get slight style changes and lines are set up that way so changing from one order to another is not a big issue" (Managing Director-Case Study A).

The effective machine layout and operations planning has been able to save time in the aspects of choosing the best machine layout for each order. Thus changing existing machine layouts to a new format within a short time (such as less than a day) and attending promptly to the bottlenecks of the manufacturing process achieves a shorter production lead time.

b) *Effective Information Management Techniques (ERP and MRP)*

There were 10 coding references as shown in the Table 20 and all of them are from 'more successful' companies. Case Studies B and C (both in the 'successful companies' category) implement both ERP and MRP to manage information and schedule the operations in the internal supply chain, whereas Case Study A implements only ERP although it shows 5 coding references supporting this theme. Email is the main mode of communication with suppliers and buyers in all case studies A, B and C. Case Study B's MRP is embedded in its ERP system and Case Study C maintains a system called "critical path" which is controlled by MRP. Production runs of small quantities are the biggest barrier to the success of an MRP and optimising manufacturing flow:

"Running an MRP system has always been difficult with smaller quantities we handle" (Purchasing Manager-Case Study A).

Case Studies A, B and C meet a shorter lead time of ≤ 90 days and implementation of ERP and MRP is one of the reasons this is achieved. These companies facilitate fast

information handling which minimises the time taken in internal material movement and operations planning:

> *"Initially we didn't have an ERP system but then we realised that having an ERP would save our time and speed the process so we decided to develop one. It was costly to develop it but now we find that it has been helped to effectively organise the internal processes" (Managing Director- Case Study B).*

c) *High Emphasis on Team Work*

The concept of team work is implemented in all 'more successful' companies and Case Study E and F (from 'less successful' category). The highest number of coding references (3 coding references) supporting this theme is appeared from the Case Study E which is a 'less successful' company (as shown in Table 20). Responsibilities for each operation or function have been assigned on a team basis so it is the whole team's responsibility to achieve the targets on time irrespective of absenteeism. A production line is consisted of different skills of people to perform different functions of a garment which is a team of sewers, quality checkers and packing and ironing workers. Incentives are also provided for the teams to encourage team work thereby encouraging collective responsibility for efficient and accurate completion of their tasks:

> *"We are mostly team-based so we offer lots of incentives for these teams to encourage them and in case of any defect found the blame will go to the whole team so the individuality doesn't mean anything ... if one person is absolutely good it doesn't mean anything rather one person is bad entire group will be better so it has to be a team otherwise end of the day we will lose" (Purchasing Manager- Case Study A).*

These companies have found that team work enables on time delivery of finished goods and commitment of the employees to achieve targets without any unnecessary time lost:

> *"At the end of the day we work for an on time delivery as we don't want to disappoint our buyers so team work help for this…also when one line is finished early and another line is still running the other line which already*

finished will attend on the still running line and finish the work early so that
kind of team work attitude is present here" (Merchandiser- -Case Study E).

d) *Implementation of CAD, CAM and RFID*

All three of the 'more successful' companies fully implement CAD; although CAM is only partly implemented. No coding references available from 'less successful' category to support this theme but 8 are emerged from 'more successful' companies. Only a few machines are available with automated functions because affording the cost of a fully automated manufacturing system has not been possible. Grading is the function for designing the marker for different sizes of a garment and is done using the CAD system. This has optimised efficiency by reducing man-handling of materials and improving the accuracy and speed of the operations:

> *"CAD system increases the efficiency because it avoids many manual duties*
> *such as laying the fabric on a table and thinking of which is going to put*
> *where on the garment" (Manager Director- Case Study A).*

> *"It's because the accuracy and the speed, we don't have to worry about*
> *anything when we have machines automated. The machine we use for pocket*
> *making is fully automated so it makes the pocket itself and comes out. CAD*
> *is also faster and we can get creative ideas through it so it's very efficient"*
> *(Purchasing Manager-Case Study C).*

The grading sheets collected from these companies were documentary evidence to prove this fact further (Appendix I).

None of the case study companies implement RFID due to the prohibitive cost involved in this process. However Case Study C already has a plan to develop a RFID system in the near future:

> *"We recently developed ERP and MRP so it is a continuous process...we*
> *will soon have our RFID system too" (Managing Director- Case Study C).*

e) *Implementation of 5S*

Only Case Study A has been able to realise successful implementation of 5S (it demonstrates 3 coding references which is the highest- Table 20). Case Study A has

found that 5S improves the efficiency and discipline of the organisation by reducing resource wastages and speeding up daily operations to achieve shorter lead times:

> *"We strongly implement 5S because it improves our efficiency ...also 5S reduces the wastage and make things easy to find and it increases the speed of the work" (Purchasing Manager-Case Study A).*

The profile of Case Study A also strongly reconfirms the fact of successful implementation of 5S system.

Case Studies B and F partly implement 5S which implies by only 1coding defence from each and it appears that managing directors have not been substantially committed to fully implement a 5S system:

> *"...we are not thoroughly implementing 5S here ...actually all 5S symbols are not implementing here but we do encourage our workers to do so. I would say we implement it up to 60 %but not 100 %"(Managing Director-Case Study B).*

f) Relatively Shorter Supply Chains

Case Studies A, B and C work directly with their buyers and suppliers so all the coding references (in total 11) appeared only from 'more successful' companies as shown in Table 20. They do not work with foreign buyers' offices located locally which make their supply chain relatively shorter than the companies work with buying offices. These companies are mainly involved with three types of business operations: manufacturing for sub-contracts, FOB (Free On Board) and NFE (No Foreign Exchange) orders. In the case of an FOB order, the manufacturer is responsible for sourcing all the materials required either from buyer nominated suppliers or local or international suppliers at its discretion. If it is an NFE order, the buyer essentially sends fabric and accessories (purchased either locally or abroad) to the manufacturer. Sub-contracts are arranged for apparel giants such as Brandix, Hidramani group and MAS Holdings in the country of origin. Suitable SMEs are chosen for sub-contracts through a compliance audit carried out by the apparel giants.

Foreign buyers directly send orders to these companies where there is considerable correspondence exchanged between the buyers and manufacturers, from order confirmation to the point of despatching finished goods:

1. Buyers send technical specifications and measurement sheets (Appendices J and K)
2. Manufacturers send the complete garment samples to buyers
3. Buyers send comments about complete garments samples to manufacturers
4. Manufacturers send trim cards to buyers for the approval of fabric and accessories to be used for the garments regardless of whether the suppliers are nominated by buyers or not (Appendix L)
5. Manufacturers send test reports to buyers especially when fabric purchased from the suppliers at its discretion
6. Manufacturers send production plans
7. Daily output reports, in and end line quality reports and etc. to buyers and many more documents whenever problems arisen while the manufacturing process is carried out.

Working directly with their foreign buyers has aided in achieving shorter lead times and higher profits as it saves the time with regard to the above stated functions carried out between the buyers and manufacturers through bypassing one step in the supply chain which is the intermediary buying office:

> *"Obviously working directly with buyers is profitable in two ways, one is the price wise and the other is we are sure about what buyers want buyers sure about what we do ...working directly with buyers cut down all the additional time that we have to spend for dealing with buying offices" (Managing Director-Case Study C).*

China, India, Hong Kong, Indonesia, Thailand and Taiwan are the common countries from which fabric and accessories are sourced. Fabric is always purchased from aboard whereas accessories are purchased locally. Most of the time, suppliers of fabric and certain exclusive accessories are nominated by the buyers and, on certain occasions, Case Study A finds that it has to transact with the intermediaries of buyer nominated suppliers to bring the fabric down in Sri Lanka. Two main foreign markets for these companies are USA and the UK. German, Switzerland, Spain are Scandinavia are other key markets for these companies.

In the case of information sharing, none of the information is shared with suppliers but buyers share sales reports and profit figures as far as these companies' products are concerned. However Case Study A's buyers do not share this information. None of Case Study A, B and C companies share profit figures with their buyers but other order related information is provided only at the request of buyers that they are obligated to send such as production plans and daily output reports. Figure 15 shows the generic supply chain of all these three companies and it can be seen that Case Studies B and C's supply chain seems to be more or less similar to each other whereas only Case Study A's is slightly different in the aspect of information sharing. Further Case Study A sources raw materials via intermediaries and directly from the suppliers while A and B only sources directly from the suppliers.

Figure 15: A Generic Supply Chain Map for the Companies Directly Work with Foreign Buyers

Tier 1 suppliers (B, C)   Tier 1suppliers (for A)   Tier 1 Customers (A, B and C)

Tier 2 suppliers (for A)   (Intermediaries)
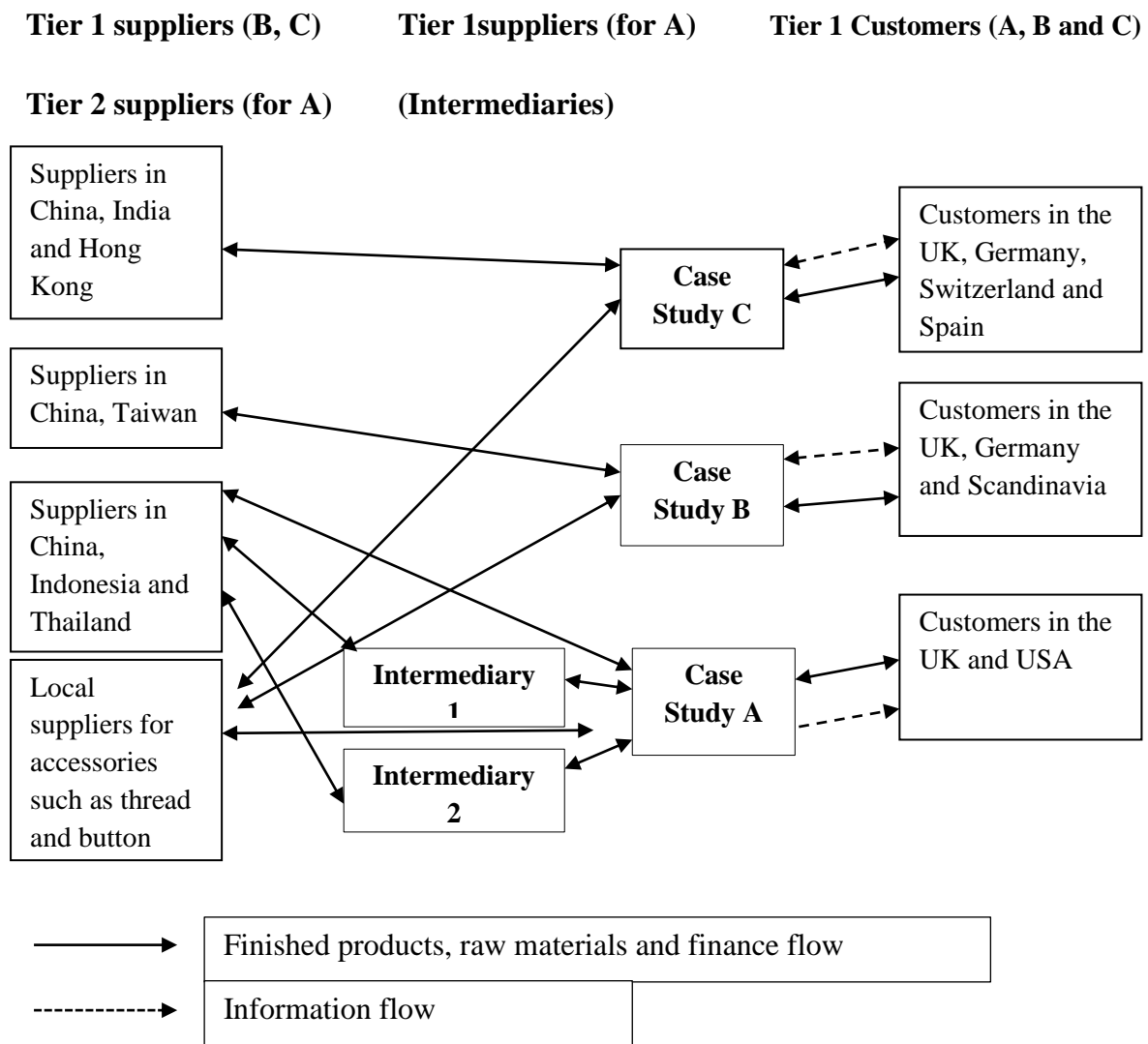
g) *Strong Mutual Understanding of the Supply Chain*

An agreement is made only for an order in terms of quantity, delivery dates, quality inspection and other important aspects such as expected standards of fabric and accessories (Appendix M). Invoices and purchase orders (Appendices N and O) along with the agreements made for each order comprise the formal structures for handling business transactions. Other than that none of these companies from either category work with their buyers or suppliers based on legally-bounded contracts. Long-standing relationships between the case study companies and their suppliers, buyers and buying offices have cemented long-term relationships which have led to strong business management on mutually understood rules and procedures. Conversely Case Studies D and F, which work through buying offices, were dissatisfied with certain decisions of these buying offices in relation to garment quality because the buying offices attributed garment quality responsibility solely to themselves:

> *"...buying offices try to safeguard them even though they are also responsible for the defects..." (Managing Director-Marketing-Case Study F).*

However, on the whole the companies that work with buying offices trust the buying offices irrespective of minor problems. More coding references (n=23) supporting this theme were found from the 'more successful' companies and these companies contact their buyers directly. Case Study B shows the highest coding references (n=10) to support this theme and this company's managing director was particularly passionate about the strong mutual understanding in its supply chain. One buying office also confirmed this theme by showing 2 coding references (Table 20). The long term relationship has instilled trust and confidence in the supply chain and improved understanding of the commitment towards each other especially among the companies who directly contact their foreign buyers. Only when it comes to working with a totally new buyer do these companies carry out a reliability test through embassies, banks and business networks.

All the companies have found that suppliers are also reliable as they have been selected based on particular criteria in terms of reliability, delivery terms and quality standards of the raw materials to ensure that they select trustworthy suppliers. However, the majority of suppliers these companies deal with are buyer-nominated suppliers. Only when they

are allowed to select their own suppliers (most of the times for the accessories) are attempts made to choose trustworthy suppliers and maintain a good business relationship. Companies that work directly with their buyers have found that working on mutually understood rules and procedures have been convenient due to less paperwork going backward and forward in the supply chain. Also solving problems in the supply chain has become effective as it saves the time taken to make important decisions:

> "...today the industry runs totally on the relationship...it runs on trust between the business partners...if you trust your business partners why you need to work with these legal contracts and also it waste your time...I trust my buyers and suppliers and we have been mutually helping to each other to solve our problems" (Managing Director- Case Study A).

> "...it's very flexible working without legal contracts and also save time when important decisions are made...so no need to hold up day to day operations till a decision is made for a problem..."(Purchasing Manager-Case Study C).

h) Successful Uncertainties Management

Following the literature (Gunasekaran *et al.,* 2001; Bruce *et al.,* 2004; Beamon, 1999) the main elements of flexibility of volume and design variations, machine breakdowns, poor supply performance and moving forward planning delivery dates were probed in the interviews. According to Table 20 this theme was more prominent from 'less successful' companies and 29 coding references in total supported this. However 'more successful' companies were more capable of handling volume and design variations than the 'less successful' companies and more coding references for the sub themes of machine break downs and poor supplier performance were from 'less successful' companies.

i) Volume and Design Variations

Managing volume and designs variations were different between the two categories of case study companies. With regard to the companies working with buying offices ('less successful' companies), once the quantity of an order is confirmed by buying offices it is difficult to change. Even if it is changed, buying offices have been flexible with revised delivery dates so quantity changes have not been a reason to delay the timely delivery of orders. Design variations have not been a problem for arranging the machine layout for

each new design. All the difficulties with a new design are comprehensively discussed during pre-production meetings thereby helping to save time. In general these companies have been flexible with quantity changes even though they ended up with high C&M (cut and make) costs:

> *"Flexibility is there for SMEs to do small quantities as long as fabric suppliers are able to meet those quantities but of course C&M cost will be higher than bulk quantity orders and buyer also will accept that"* (Managing Director-Marketing and Administration-Case Study F).

The companies from the 'more successful' category have experienced considerable changes in terms of the quantity of orders. Quantities tend to change more frequently even while the manufacturing process of that order is being carried out. However, in Case Study A, once volume changes are agreed upon when particular delivery dates are set prior to the start of manufacturing; buyers have the flexibility to vary only up to ±25% of the original quantity. If a buyer requires a change in excess of ±25%, the company will only accept what is possible with existing capacity because the buyers are specific with their delivery dates as well. What is impossible with existing capacity will be rejected. Design variations are not that common in Case Studies A and B because, Case Study A's majority (90%) of products are only men's shirts and Case Study B's (80%) industrial uniforms. Case Study B still experiences design variations with the range of fashion garments (20%) even though fashion garments are not prominent in its product portfolio. Pre-production meetings have been able to solve this without any significant time losses.

> *"...with regard to fashion garments, not like with uniforms we get different designs but then we discuss them in our meetings in detail before we start production so it doesn't make any considerable delays for our production"* (Purchasing Manager- Case Study B).

In contrast, Case Study C experiences design variations to a great extent. Past experience working with a high variety of designs and the flexibility of machinery are two ways that have been relied upon to solve the problem and do not cause major time losses taken to shift in between different designs and volumes:

> *"Design variations are very common for us and therefore we can manage to change very fast" (Managing Director- Case Study C).*

> *"Fashion market itself is uncertain; that's why every time we get different sizes of orders ...we have never been running late with our orders due to this reason... we are ready to deal with this...because we know this ...we have been in the industry for a long time..." (Managing Director- Case Study C).*

ii)   Machine Breakdowns

Preventive maintenance of machinery is carried out by all the case study companies to ensure that machinery breakdowns are minimised. Since every machine is very specific in terms of its functions Case Study A ensures that necessary basic adjustments are made to each machine before commencing a new design with the intention of minimizing machine breakdowns. Back up machines are also available but only for the basic low-cost machines. There are some machines which can perform specific functions but keeping back up machines for them has been very expensive and therefore these companies prefer to have skilled mechanics on standby as a cost saving strategy rather investing in depreciable, high cost machines. Case Study C has allocated a separate mechanic for the seven production lines so each line has a dedicated mechanic. Whenever a machine either basic or sophisticated is broken down the mechanics work to minimise the time lost to repairs thus on the whole machine breakdowns are not a major issue to delay on time delivery of the orders:

> *"We don't keep back up machines for sophisticated machines as they are costly, so what we do is we try our maximum to fix them as quickly as possible to avoid delays in the production" (Managing Director-Case Study D).*

> *"...so machine breakdowns don't count that much for us and also it is not a big issue for any delays in the production" (Merchandiser-Case Study E).*

iii)   Poor Supplier Performance

The companies which work through buying offices deal with suppliers only for accessories such as thread, buttons and elastic which always use local suppliers. Fabric is

supplied by buyers because these companies work only for NFE orders. The companies with direct contacts work both with buyer-nominated suppliers and their own choice of suppliers. Handling FOB orders means they also have to source fabric from the suppliers either nominated by buyers or the choice of their own. There are a few common strategies these companies practice to minimise the delays can be caused by poor supplier; performance. These strategies include: having more than one supplier for the same raw material as a measure of meeting any unforeseen contingencies; maintaining a good relationship with its regular suppliers: careful supplier selection and evaluations carried out in terms of the quality of products; reliability; and the terms of delivery. The stocks of selected suppliers are also considered under urgent conditions:

> *"... for one product we keep about three buyers because sometimes when we depend only on one supplier our production might suffer so it's better to have a few suppliers and it will be flexible for us" (Merchandiser- Case Study D).*

> *"We hardly find such a situation because we choose our suppliers based on the level of service they provide but when it happens, they immediately change the goods merely because of the good relationship we have with them" (Merchandiser- Case Study E).*

> *"We have a very good relationship with our suppliers which helps us to work with shortages, damages, and everything" (Purchasing Manager- Case study C).*

A one-off mistake of a supplier is inconsequential over the long term relationship with suppliers so it is rare that a decision is taken to withdraw any supplier:

> *"...and if we found that any supplier does not meet these standards we will discontinue that supplier but we hardly do that because it's a long term relationship we have been maintaining with them and just because of a mistake we can't kick him out" (Managing Director- Case Study B).*

iv)   *Moving Delivery Dates Forward*

Production plans are prepared with due consideration for the delivery date of an order. Basically it is back-scheduled from the date on which goods must be despatched.

Production operations are planned a few days back from the delivery date and this margin is to meet any uncertainty in the production environment so on-time order delivery will be ensured.

> *"Moving forward delivery dates is not a problem as most of the times our goods are ready well in advance of the delivery dates" (Managing Director- Case Study D).*

However it is rare that buyers request that goods are shipped before the required date.

> *"...most of the times we make sure that goods are ready well before the delivery dates and we inform them that goods are ready and can send them if you want... but they hardly take them earlier" (Managing Director- Case Study E).*

4.2.2 Successful SCM Strategies in Relation to Value Addition to the Products

A parent node was created for value addition-related successful strategies and six sub-themes and patterns emerged from the case study evidence of interview and documentary data: i) effective logistic cost management techniques, ii) high level of quality management, iii) innovations and low product development times, iv) low range of products, v) productive employees and vi) proper customer order path management. The identification of success factors is based on reviewed theory that is contributing to higher value added (see Section 2.2.10). The matrix query run for the parent node of value addition-related successful strategies shows the number of coding references (Table 21) made from interview and documentary data for each sub-theme and pattern. Surprisingly the coding references from 'less successful' companies support more than the 'more successful' companies for the sub-theme of high level of quality management but the rest of the sub-themes are evident more from the data from 'more successful' companies. The association between the sub-themes and main theme is presented in a model (Appendix P). These sub-themes are discussed below in detail with reference to the evidence gathered from the case studies. It can be seen from the data that all the companies have made an effort to minimise costs rather than value generation because the ability to negotiate over the price of the garments frequently lies with the buyers.

Table 21: Node Matrix-Value Addition Related Successful SCM Strategies

	Case A	Case B	Case C	Case D	Case E	Case F	Case 1-Buying office	Case 2-Buying office
1 : Effective logistics cost management techniques	6	3	8	6	4	3	0	0
2 : High level of quality management	4	4	5	5	4	6	0	2
3 : Innovations and low product development times	2	1	1	0	0	0	0	0
4 : Low range of products	2	2	3	0	0	0	0	0
5 : Productive employees	3	4	4	0	2	1	0	0
6 : Proper customer order path management	1	2	1	0	0	0	0	0

a) *Effective Logistic Cost Management Techniques*

Minimising logistics costs has been difficult for all of the case companies as more than 80% of raw materials are imported. The fixed rates of import and export duties and rising levels of fuel costs have been beyond the control of these companies. However, the companies that work with buying offices have taken a few measures to control local transport costs which are evident from the Table 21 by the coding references (n=13 references). Case Study D shows the highest coding references (n=6) to support this:

- Careful planning of production activities for the next working day has helped to minimise the number of times the transportation modes are used between the office and factory.
- Prior confirmation of the number of items transported from buying offices to factories to decide which mode of transport is used,
- Trying to buy as much as material at once instead of sending vehicles at different times to the same location (mostly to the buying offices)

- Selecting the local suppliers who deliver products.

The 'more successful' companies apart from controlling local transport costs implement their own measures to control cost involved in the process of import raw materials, new product development and grading (This finding was evidenced from Table 21 showing 17 coding references from 'more successful' companies which is higher than that of 'less successful' companies). Case Study C has been able to reduce the import cost of fabric from China by working with shipping agents who use console boxes so they pack different companies raw materials together. This has been largely supported to save shipping cost as it does not have to pay the cost of a full container especially when a half of a container is imported. Furthermore these shipping agents do not charge for the local delivery of products and Case Study C has employed its own staff at the sea port to unload fabric:

> *"...we work with shipping agents who have console boxes so what they do is they consolidate different company's stuff together to reduce the costs or we have to pay the price of a full container for even half a container ... I am controlling the cost of freight that is transport from China to here and also locally they don't charge anything extra ... we have our own people for clearing the goods at port so our shipping cost stays at a low..." (Purchasing Manager-Case Study C).*

The CAD system has been able to save time and costs involved especially in new product developments with company A and grading processes with Case Studies B and C. ERP and MRP are the measures which have been taken to reduce the information processing costs by Case Studies A, B and C. However, as these companies have not been able to connect their ERP systems with external parties, all possible efforts have been made to ensure that emails are the most commonly used mode of information transmitting with external parties as a mechanism of cost reduction. The companies that do not use either ERP or MRP try to avoid telephone and faxes as a means of cost reduction and use emails everywhere possible.

> *"...we mostly use internet ...we now use even internet calls to reduce communication costs..." (Purchasing Manager-Case Study A).*

"We use ERP system for internal information transmitting ...so it's very much low...but encourage employees to use emails as much as possible when dealing with suppliers and buyers ..."(Managing Director-Case Study C).

b) High Level of Quality Management

This theme was supported by all the companies equally as evident from coding references shown in the Table 21. Therefore it does not show any significant differences between the coding references from individual companies. There are certain mechanisms imposed by direct buyers and buying offices to ensure the quality of the materials used to manufacture garments: trim cards (Appendix J) are sent to buyers or buying offices by manufacturers including the samples of fabric and all other accessories to be used for garments for the approval, test reports for the fabric. Other accessories must be sent to direct buyers or buying offices when any of the material is purchased from the suppliers at the discretion of the manufacturer. Random visits are made by the agents of the direct buyers and buying offices for quality checking and obtaining buying offices' approval is essential prior to shipping the final products. Apart from these mechanisms, manufacturers implement their own quality control systems to ensure the highest possible level of the quality of products:

"We have our own quality system called seven zero system which we implement in-house...we have a quality manager and under him there is an assistant. Then we have five quality controllers and quality checkers...they are responsible for in and end line quality inspections and implementing the seven zero system..." (Purchasing Manager-Case Study C).

On average the rate of defectives is less than 2% with all the companies irrespective of whether they are from 'more' or 'less successful' companies:

"We try to keep it at 2% or less but when we start a new product, normally on the first day it goes up to 8-10% but in the second or third day it stabilises anything between 2-5% or less but every piece is checked and then again its finally checked and audited so when we finish the products they mostly goes out without any defects..." (Managing Director-Case Study B).

Since defective products inhibit production efficiency, the quality of garments is checked in terms of all the operations carried out to manufacture a garment: cutting, sewing, before ironing, after ironing and packing. Mid and end line quality inspections are performed before the final quality inspection. Quality checkers are responsible for mid line quality inspections and if any defects found they are rectified immediately and quality controllers and quality assurance staff finally approve the quality of the products. The final quality inspection is mostly carried out by quality assurance manager and a detailed report is prepared with the defects found and actions needed to correct them (Appendix Q).

Even the pre-production runs pass through all these steps of quality inspections as the samples should be sent for buyers' approval before the commencement of bulk production.

Rigorous quality checking at the early stages of production prevent passing mistakes for the next level of operation so it saves time and cost thus can be added more value to the final products:

> *"...we have increased the number of checking areas to prevent defects carrying forward to the next level" (Managing director-Case Study A).*

The higher quality standards of the products always offer more value for the price and Sri Lanka has gained a positive reputation for producing higher quality garments:

> *"...as far as Sri Lanka is concerned quality that we offer is much higher than other countries" (Managing Director- Buying Office 2).*

c) *Innovations and Low Product Development Times*

Case Study A manufactures 90% men's shirts and 10% ladies' blouses with basic designs. It offers its own brand to the UK market. Case Study C develops new designs for its buyers' labels and its buyers have occasionally accepted them. Case Study A therefore is the only company that manufacturers and exports its own brand among the chosen companies. This theme is only prominent in Case Studies A (2 coding references) and C (1 coding reference) as indicated by their coding references presented in Table 21. This company is therefore highly involved in continuous improvement of its own brand thus

innovations are quite prominent with regard to its own product. Case Study A's research and development staff are headed by a foreign employee who is experienced in handling internationally renowned men's shirts brands. The time taken for either the development of new products or existing products and adding a new design on the production lines have not comparably been higher as men's shirts are less complex in terms of the designs:

> *"What we do is only shirts so in our case it is not much difficult like other factories those who do fashion garments since we don't get large variations in the designs. Only the design of fabric is different… it can be check, stripes and plain and this can be easily managed rather than the fashion garments. Our sewing girls also like it because it's very easy for them to switch from one design to another" (Purchasing Manager- Case Study A).*

Case Study B has also achieved low product development times due to the high predictability of the garment designs as the majority of its product range is industrial uniforms. Innovations add value to the products whereas low product development times also reduce the time cost of products which in turn adding more value to the products. CAD system has been largely helped in reducing the time of new product development:

> *"…CAD system largely saves the cost of innovations in terms of time…if we had to do them manually it wastes our time and even it is not faster…so finally we waste our resources for nothing…" (Purchasing Manager - Case Study A).*

d) *Low Range of Products*

One of the criteria employed to determine the level of successfulness of the companies in terms of successful implementation of SCM was value addition per employee. The companies with a higher value addition per employee were identified as 'more successful' companies. Case Studies A, B and C were from the 'more successful' category and most surprisingly have a low range of products manufactured when compared with the 'less successful' companies. Therefore the coding references only appeared from these companies as shown in Table 21. Case Study A manufacturers 90% men's shirts and 10% ladies blouses with basic designs. Industrial uniforms (80%) and ladies' fashion garments (20%) are manufactured by Case Study B. Case Study C manufactures only ladies blouses and dresses so it might have achieved a higher value addition per employee and shorter

lead times. For example, Case Study A offers its own brand to the international market with innovations and also all of these companies perform efficiently in terms of lead time (speed) in comparison with 'less successful' companies.

A low range of products have resulted in less complexity and higher familiarity of sewing operations and thus higher SMV (Standard Minute Values) values among the 'more successful' companies. The time taken to develop one garment depends on a value called SMV. All the operations required to manufacture a particular type of garment are laid down and the time taken for each operation is calculated so that the total number of minutes to manufacture that particular garment can be calculated. The value of a minute is based on SMV and is dependent upon the design and type of garments. Employee efficiency rates are also based on SMVs as the lower the SMVs. Higher efficiency rates are evident within Case Studies of A, B and C:

> *"...uniform designs are highly predictable ...we finish these orders earlier than the fashion garments…" (Purchasing Manager - Case Study B).*

e) Productive Employees

Productive employees accelerate production efficiency by minimising errors that do not add value to the final products. Cross functional teams or employees trained on multi-functions are able to perform more than one function thus tends to add more value to the products. More than 50% of the workers in the Case Studies of A, B and C which are 'more successful' companies are trained on multi-functions. Hence the coding references supporting this theme were more appeared from the 'more successful' companies (Table 21- 11 codes in total). About 30% of the workers from Case Study F are also able to perform multi-functions which are shown by 1 coding reference. Case Study E (n= 2 coding references) considers training their employees on multi-functions too. However, these are 'less successful' companies. There were no coding references from Case Study D to back up this theme as it does not involve in training the staff due to its tight manufacturing plans. In general, these companies perceive multi-function staff training as an investment and risk-minimising strategy to successfully survive with frequent staff fluctuations. The functions that need special skills, such as pocket attaching, cannot be performed by everyone. Thus having trained many employees on such functions may

161

avoid bottlenecks and inefficiencies whilst the workers' level of efficiency is also maximised:

> *"We train them on performing multi tasks because we consider it as an investment… or it will be risky with staff changes as they keep on changing their jobs…"(Purchasing Manager- Case Study B).*

Case Study B carries out a grading system of sewing staff depending on the number of functions a sewer can perform in developing a garment. Grade A sewers are able to perform the majority of the functions and Grade B sewers are a lesser number than them and Grade C sewers are those who can perform the least number of operations. Sewing staff are regularly evaluated for performance and upgraded accordingly and incentives are higher as they are upgraded. At present more than 50% of the workers are from the Grade A.

Case Study A's management is satisfied about the creativity of its research and development staff as well. Research and development activities for staff development are not common within Case Studies B and C however on the odd occasion when research and development initiatives are considered, it is conducted by the managing directors and top management.

f) *Proper Customer Order Path Management*

The companies which directly contact foreign buyers are thoroughly aware of every order channel and lead times, from the point of an order is being made through to its dispatched. The coding references as shown in Table 21 appeared only from 'more successful' companies to support this theme which were 4 in total. Case Study A has physically mapped the channels which has been helpful in determining redundant channel capacity. Bottlenecks in the production system can be reduced by management's knowledge of the customer order path. This has been found to reduce the additional cost of an order going through an unnecessary longer path; thus non-value adding routes can be eliminated. The lack of knowledge about customer order paths also causes difficulties in surviving profitably in industry especially with regard to SMEs:

> *"...I know very much about each and every channel of my orders go through…we are SMEs so we have to be very much aware of everything*

happening around otherwise it's very difficult for us to survive in the industry...I know which order is in which status at a particular time..." *(Managing Director - Case Study B).*

4.2.3 Successful SCM Strategies and Direct Contacts with Foreign Buyers

The companies with direct buyers have been able to improve profitability, diversify business risk and develop a strong business network and business relationship management. These sub-themes and patterns emanated from the interview data and documentary evidence of the case studies and the relationship between them was obtained in a model generated by Nvivo (Appendix R). The sub- themes of improved profitability and business risk diversification and strong business network are more prominent as in-vivo codes and a strong business relationship management is theoretically derived (see Section 2.2.10). Table 22 shows the results of a matrix query run for the parent node of successful strategies related to direct contacts with foreign buyers. Only the data gathered from companies that work directly with foreign buyers supported the emerged sub-themes and patterns. Some evidence was available from Buying Office 2 as well to support the sub-theme of strong business relationship management. Therefore backing this theme coding references are only shown from 'more successful' companies and buying office 2 (Table 24).

Table 22: Node Matrix-Successful SCM strategies Related to the Direct Contacts with Foreign Buyers

	Case A	Case B	Case C	Case D	Case E	Case F	Case 1-Buying office	Case 2-Buying office
1 : Improved profitability and business risk diversification	1	2	1	0	0	0	0	0
2 : Strong business network	1	2	2	0	0	0	0	0
3 : Strong business relationship management	11	7	9	0	0	0	0	2

a) *Improved Profitability and Business Risk Diversification*

Working directly with buyers has typically been more profitable than working through buying offices. All of the 'more successful' initially started with buying offices. Working via buying offices has been less profitable and they have lost the control over their own businesses:

> *"...initially I worked with buying offices then I found it is not that profitable so I wanted to have a control over on my own business" (Managing Director- Case Study B).*

Subsequently as they have found that it is a high risk to totally depend on buying offices' orders for a low profit, they have initiated working directly with buyers to diversify business risk and improve profits:

> *"We have found ups and downs in business with buying offices so we wanted to diversify and have a risk balance in our business therefore we took the initiative to find our own buyers" (Managing Director- Case Study A).*

b) *Strong Business Network*

The companies that work with direct contacts have been able to gradually develop a strong business network which has been resulted in helping to approach new buyers. Initially, Export Development Board (EDB) missions have been helpful in finding direct buyers but later on, as they develop the business network, foreign buyers have directly approached. Case Studies B and C have been working directly with buyers for more than 10 years and A for five years:

> *"In the first place I have found them through EDB missions and then gradually developed business network, helped to find more buyers" (Managing Director-Case Study B).*

> *"Currently we do not really depend on these EDB missions to get new buyers but we have our own business network and we work in a different strategy…" (Managing Director-Case Study C).*

The strong international business network has been immensely useful in finding reliable and trustworthy new buyers so these companies proudly mentioned the value of the business network. They have found it as a strategy of reducing the risk of working with new direct buyers:

> *"When new buyers come and meet us we enquire about them through the business contacts in the industry to make sure that they are reliable buyers and if we found that these buyers are trustworthy to work with we would commit to do business with them or sometimes it would be based on a good reference coming from an international or local business contact"* *(Managing Director-Case Study A).*

> *"Our buyers are very reliable and we have very carefully picked them up through our business network...we obtain references of new buyers through our business network..." (Purchasing Manager - Case Study C).*

c) *Strong Business Relationship Management*

Maintaining direct contacts with foreign buyers has facilitated the development of a better relationship between the buyers and manufacturers. The highest coding references (n= 27) from all the companies to substantiate this theme implies that maintaining direct contacts has been more supported in developing a strong business relationship management than the other two themes (strong business network and improved profitability and business risk diversification). Case Study A shows the highest number of coding references to support this theme (Table 22). Relationship devolvement was not simple at the beginning as these companies found their direct buyers. However, gradually it has been turned into a strong mutual business relationship. These companies have realised the value of maintaining a good relationship with members of their supply chains:

> *"Business is all about relationship-building and as I believe if we haven't built up a good relationship with our buyers and suppliers it's not a good feature of a good business man so I really appreciate relationship building because it will help you to minimise the problems that you get every day..." (Managing Director-Case Study C).*

These companies have been very careful in the selection of buyers which has led to an increase in trust and confidence among the supply chain members. On certain occasions they have compromised on price for reliable suppliers and buyers. Therefore, working with reliable supply chain members has largely contributed to continuous and consistent business relationships:

> *"Mostly in our case we go for reliability...we find price is not the only criteria to consider. Prices are more or less the same with most of the people and we believe that we would always go for reliable suppliers even up to 10% additional cost found to be the lowest better"* (Managing Director-Case Study A).

> *"Price is one of the main factors because if it is not covering our cost of manufacturing we will not make any profits but it is not the only factor. The relationship we have maintained with our buyers is also an important factor so it's always a better compromise between these two factors"* (Managing Director-Case Study C).

There have been a few instances when buyers have made sacrifices in order to continue a sustainable business relationship with the manufacturers:

> *"...we had a buyer who placed an order for some very difficult garments and we had to depend on a third party to help us with certain parts of them. Merely on the delivery date whoever agreed to ...said, we have good orders, we are full and we cannot do anything now. At the last moment we couldn't find anybody who would do the order so we sat together with the buyer to identify which garments can be delayed and which garments cannot be delayed also with the quantities. Then they informed us to ship the raw materials to somewhere near to their market and they have got done them there. They said that if you have to do it, you have to airfreight and it will cost you very much... so why don't you instead ship the goods by air at our cost ...I thought it would be very fair for us"* (Managing Director-Case Study A).

These companies have even made sacrifices at an additional cost to preserve the relationship with the buyers:

> *"...last night also I had to a shipment but then at the last moment we found some defects in the products so we decided not to ship ...we will airfreight them and it will lose money but we will not lose our customer (Managing Director- Case Study B).*

Buyers and suppliers have been trustworthy but whenever any problem arose the strong business relationship maintained with supply chain members was tested to negotiate and arrive at the best solution without harming the business relationship.

4.3 The Constraints in Implementing Effective SCM Strategies

The barriers faced by garment manufacturing and exporting SMEs in Sri Lanka in implementing effective SCM strategies are presented below under each factor considered for this research: lead time, value addition and direct contacts with foreign buyers (Figure 16). Matrix queries for each main theme were run in order to determine the number of coding references from interview and documentary evidence to generate each sub-theme.

Figure 16: The Constraints to Improve Existing SCM
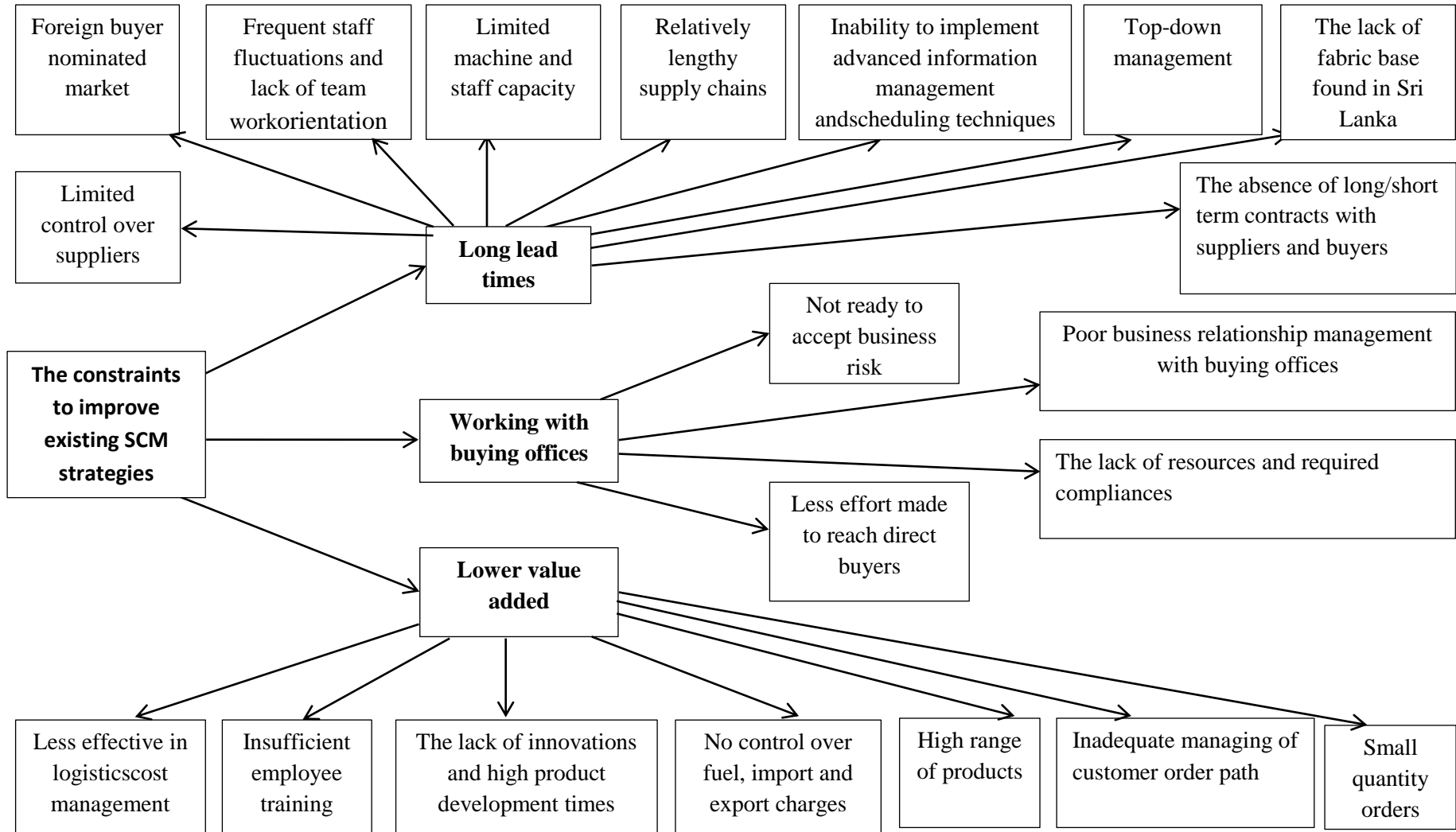
The sub-themes that emerged (shown in Figure 16) were classified into two broad categories of internal (micro environmental) and external (macro environmental) barriers to the companies as shown in the Figure 17 based on reviewed SME related literature (see Section 2.3.2 and 2.3.7). Some of the sub-themes were classified together under the main categories identified. However, foreign buyer nominated market and low profit marginal niches are largely context based so appeared as a result of the investigation. Figure 17 is discussed in detail with the light of previous literature in the next chapter (see Section 5.3).

Figure 17: Map of the Barriers to Implement Effective SCM Strategies
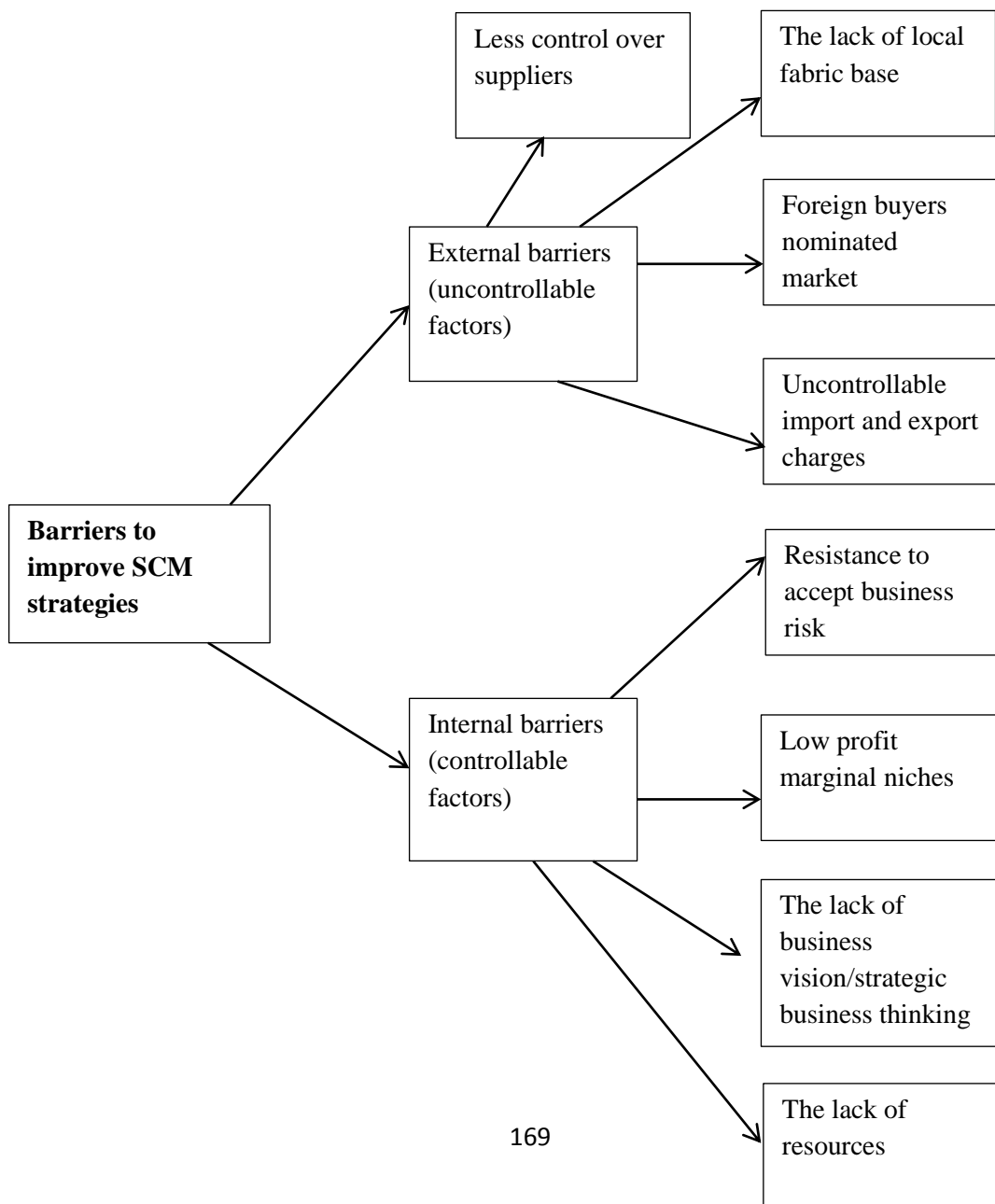
4.3.1 *Constraints Faced in Relation to Improve Lead Time*

The sub-themes that emerged from 'barriers to improve lead time' were: the absence of long or short term contracts with suppliers and buyers, foreign-buyer-nominated market, frequent staff fluctuations and the lack of team work orientation, inability to implement advanced information management and scheduling techniques, the lack of fabric base found in Sri Lanka, limited control over suppliers, limited machine and staff capacity, relatively lengthy supply chains and top down management. Table 23 shows the node matrix of the matrix query run for the parent node of lead time related barriers and its child nodes. A model was also generated to demonstrate the relationship between the parent node and child nodes (Appendix S). The number of coding references from interview data and coding references to each of the sub-themes that emerged from the data are demonstrated in this table. The coding references were available equally from both company categories to support almost all the sub-themes and patterns emerged except for the sub theme of relatively lengthy supply chains. Every sub-theme of the parent node of lead time related barriers is discussed below with the backing of case study evidence.

Table 23: Node Matrix-Barriers to Improve Lead Time

	Case A	Case B	Case C	Case D	Case E	Case F	Case 1-Buying office	Case 2-Buying office
1 : Absence of long or short term contracts with suppliers and buyers	2	3	2	2	1	1	0	0
2 : Foreign-buyer-nominated market	2	1	1	2	1	2	0	0
3 : Frequent staff fluctuations and lack of team work orientation	1	1	1	2	3	2	0	0
4 : Inability to implement advanced information management, CAD, CAM and scheduling techniques	7	4	6	8	9	9	0	2
5 : Lack of fabric base found in Sri Lanka	3	7	4	2	4	4	1	0
6 : Less control over suppliers	5	1	1	1	2	4	1	2
7 : Limited machine and staff capacity	4	4	3	5	5	6	0	1
8 : Relatively lengthy supply chains	0	0	0	8	4	3	2	6
9 : Top-down management	1	2	2	2	1	2	0	0

a) *The Absence of Long or Short Term Contracts with Suppliers and Buyers*

None of the companies work with short or long term contracts so they do not have collaborative partnerships with members of their supply chain. Especially the long term collaborative business relations among the supply chain members lead to improved supply chain performance through better understanding of each other as they work together with same business partners for a long time period. The highest number of coding references of 3 was evident from the Case Study B (Table 23) as the managing director of this company explained about the improved business relationship it has developed as a result of working

with the same buyers over a long time period. This can result in less time involved with problem solving so efficiency and speed of supply chain network are improved. All of the companies studied agree on certain terms and conditions that are related to the order being carried out and buyers and suppliers are different from one order to another. Invoices, order confirmation sheets and purchase orders are the documents that hold the formality of the business transactions to a certain extent:

"The suppliers are changed from order to order" (Merchandiser-Case Study D)

"There are several suppliers who supply the same good so we go for the lowest price among them otherwise we don't have long term contracts with our suppliers" (Managing Director- Case Study D).

However, the lack of business vision depicted in the Figure 17 lies with the management of these companies in not achieving improved supply chain performance through the long term collaborations with their supply chain members.

b) Foreign-buyer-nominated Market

This is a constraint that emerged as a result of the nature of the macro business environmental conditions as depicted in Figure 17. Documentary evidence provided substantial material to support the interview data in terms of measurements sheets, sample comments forms, fabric and accessories inspection reports, trim cards, marker development and grading sheets, bill of material, sample plan and technical specification sheets. These companies irrespective of whether they directly contact the buyers or not are obligated to manufacture the designs of the foreign buyers and approval should be obtained from the buyers before proceeding to the next stage of the production. The coding references occurred from all the case studies without any significant difference between 'less' and 'more' successful companies backing up this theme (Table 23). Initially, once the order is confirmed samples should be sewn with the measurements and technical aspects sent by the buyers. Then these samples are inspected for any improvements by the buyers. Following the buyers' approval, the companies can start bulk production but before this, approval for the fabrics and accessories should be obtained from the buyers. Most of the fabric suppliers these

companies work with are nominated by buyers, however they must still send the samples of fabric and other accessories to the buyer for the approval. If any raw material was purchased from the suppliers at the manufacturers' discretion, test reports for the quality standards of the raw materials obtained from a third party must be sought. At certain times buyers nominate the suppliers despite these companies being able to source some raw materials locally or abroad for a lower price but equal quality:

> *"For FOB orders they nominate the suppliers whom they have a good relationship with but sometimes we find the same fabric with same quality which we can buy from someone else at a lesser price but still our buyers need to buy exactly from their supplier nominated by them and when we tell them that we can buy the same at a lesser price from another supply they say don't do that buy from the supplier we nominate ..." (Purchasing Manager -Case Study A).*

> *"Right now it's a British company whose compliances we have met says that fabric is coming in first week of January, then they say said 30th of January, but it came only just last Saturday. Now they are asking me to do this and that, I said no, there is a certain procedure, you can't expect to stop my line that I am doing which I explained to him earlier so they have to accept that type of delay, because if they were going to pay me for idling time, then it's OK I can idle the factory" (Managing Director-Marketing and Administration- Case Study F).*

Not being able to make decisions about garments, even about the slightest modifications, creates time inefficiencies as there is waiting until the buyers' confirmation for every decision from the point of order acceptance to final goods despatching. This slows the production process and thereby increases lead times.

c) *Frequent Staff Fluctuations and Lack of Team Work Orientation*

Frequent staff fluctuations (Appendix T) are a common scenario and the case study companies have found that this is one of the reasons behind the lower efficiency rates. This is also a barrier internal to the companies and lack of business vision depicted in the Figure 17 is behind this constraint. This is especially the case with 'less successful' companies as is evident in their low efficiency rates, higher absenteeism and labour turnover rates. Moreover,

confirming this fact more coding references appeared from 'less successful' companies as shown in Table 23. Absenteeism and frequent labour turnover interrupt the manufacturing operations schedules. This situation becomes worse if it is a worker with special skills such as pocket attaching. Even the replacement of such a worker does not result in returning to the same efficiency rate:

> *"It's very difficult to keep to the pre- planned days because at the moment the biggest problem we have is the staff, absenteeism is higher ...this affect our efficiency because there are particular workers who can perform special tasks like pocket attaching, everyone can't do them so what happens is if that kind of a worker is absent it will affect very much on our daily production output levels. I can replace him from a different section but the efficiency will not be there so the entire line will get affected when one operation getting delayed in the line like this" (Purchasing Manager- Case Study A).*

Case Studies D and F are not very focused on improving team work. Instead of targets for teams, individual target completion is more important in the working culture of these two companies. However, individual target assignments can cause delays, especially with less efficient workers, which can be compensated by team work.

d) *Inability to Implement Systems for Improvement*

Case Studies D, E and F that represent the 'less successful' category implement none of the techniques of information management (mentioned in Section 2.2.8): ERP, RFID and MRP or CAD and CAM systems. Evidence of this is derived from the high number of coding references (n=26) shown in Table 23 from companies which are 'less successful'. One buying office also showed 2 coding references to confirm this. The techniques of JIT and 5S are also not implemented. Only salary packages, account systems and payroll methods are computerised. Case Study E's internal operations are electronically recorded but this cannot be recognised as a formal ERP or MRP system. The benefits of the implementation of proper information and material-handling systems have been not recognised by these companies which subsequently result in long lead times due to the time wasted in handling information with manual methods. While cost and lack of skilled workers have been the main reasons for

Case Study D to not implement these techniques, Case Studies E and F have found that the existing system is running without any considerable issues so cost has not been the main reason for them:

> *"We didn't find any reason to use these techniques since the existing system is running smoothly without any problem otherwise cost is not the main issue for us not to implement them. We tried to develop an ERP system but we found that we are OK with existing system so we decided not to" (Managing Director-Case Study E).*

Emails are the main method of communication with buying offices and suppliers and telephone calls are used only in urgent matters. Manual methods such as memos, written reports and letters are also still used.

CAD is not used in these companies as they manufacture the designs received from the buying offices and very few machines are available with automated functions. The lack of automated machines minimises the efficiency in terms of problems with speed, neatness and accuracy. A lack of funds is the reason these companies do not own machines with a higher capacity of automation:

> *"....we are not financially strong enough to create such a manufacturing environment...of course large companies could have ..." (Managing Director-Case Study D).*

> *"There are many advanced machines in the industry but we are limited of this kind of machines basically due to the cost of funds" (Managing Director - Marketing and Administration, Case study F).*

Surprisingly 5S is not implemented well even in the 'more successful' companies. Case Study C, from the 'more successful' category, does not implement 5S at all due to the lack of space available in the factory when ERP and MRP are well established.

Case Study B, again a 'more successful' company, only implements the cleanliness aspect of 5S system. Inability to understand the contribution made by a 5S system to improve the efficiency has led to devaluing the implementation of 5S in their companies:

> *"The person in charge who was responsible for 5S resigned and then it stopped in the middle" (Managing Director-Case Study D).*

Case Studies F and E that represent the 'less successful' category partly implement the 5S system. Unfortunately these companies have been unable to realise the value of implementing 5S in their organisations in terms of being selected for orders of the buying offices even though 5S or CAM is not compulsorily needed as requirements of a compliance audit (the auditing process carried out by a buying office to ensure a particular company is capable of manufacturing its orders):

> *"Actually 5S and CAM are not parts of a compliance audit but if they have them that will be an added advantage for them to be selected for an order" (Managing Director- Buying Office 2).*

Lack of skilled staff is the main reason for the absence of a 5S system which minimises the efficiency in an organisation due to the increased time taken in decision making and operations planning.

JIT is implemented up to a certain extent only in Case Study A. No other companies implement JIT as a scheduling technique for inventory levels. Scheduling inventory levels to a minimum level have been difficult for Case Study A due to the financial cost involved in the process between purchasing raw materials on a credit base and receiving money from the buyers. Even though raw materials are purchased on a one-month credit period, they find it impossible to ship the finished goods before the credit period is over therefore resulting in Case Study A paying a finance cost for exceeding the credit period. Case Study A is able to pay back the suppliers only when money is received from the buyers once the finished goods are shipped. However since Case Study A's lead time is $\leq$ 90 days, it cannot pay the suppliers prior to the credit period of one month.

"We implement JIT up to a certain degree and it's very difficult to fully implement it since we buy our raw materials on credit base. Sometimes we have to exceed the credit period and in that case we have to pay a finance cost. If we can implement JIT fully we will not pay any finance cost but until we get money from the buyers and we can't pay our suppliers and practically the credit period we get from our suppliers is no more than a month and it's very difficult to finish the products within a month and to get money from the buyers to pay for the suppliers" (Purchasing Manager- Case Study A).

Focusing on low margin niche markets has prevented a sound cash flow which has made resources less available for investment. The internal barriers of low profit margin niches and the lack of resources shown in the Figure 17 better explain this condition.

e) The Lack of Fabric Base Found in Sri Lanka

The lack of a fabric base in Sri Lanka is a common barrier for both types of companies so coding references are observed from all the companies as presented in Table 23. However the highest was from the Case Study B which 7 coding references and as this company handles more FOB orders, this may be the reason for this. More than 80% of the required raw materials are imported by all the companies. Fabric is essentially imported while accessories are sourced locally. China, Taiwan, India, Hong Kong and Indonesia are the main suppliers of fabric with China being the main fabric supplier.

On average two weeks are needed to sea freight fabric from foreign countries to Sri Lanka however there have been instances when it has taken longer than this. Companies that work directly with their buyers have found that more orders from new buyers can be obtained if they can further reduce the lead time:

"...we get enquiries to see whether they can get products earlier than our usual lead time. The fabric supplying part is mostly the barrier to improve lead-time because it takes time to come here. We don't produce fabric here so that's the main problem" (Managing Director- Case Study A).

Currently these companies are within the limit of ≤ 90 days. If the time needed to sea freight fabric can be eliminated it can be further reduced up to 75 days. However, the current buyers are satisfied with 90 days so they continue to work with these companies. The only alternative for decreasing the time taken in sea freight of fabrics is to use air freight. This, of course, will be at the expense of low product prices:

> *"It will be a very big advantage if we can reduce lead time. But we can only reduce up to 15 days. Then fabric and accessories should be air freight instead of sea freight so we can cut the extra time taken for sea freight but only problem is whether the buyer is ready to pay the extra cost…" (Managing Director-Case Study C).*

> *"...if we can further shorten the lead times as an industry we can qualify for more orders ... obviously there are buyers who prefer to have goods within a shorter time" (Managing Director-Production-Case Study F).*

The reasons behind the inability to source fabric within Sri Lanka are: a limited range of fabric is manufactured in Sri Lanka only by the large players as a form of backward integration; it is not manufactured for the open market due to the limited capacity; more knit fabrics are manufactured than woven so the high cost of locally manufactured fabrics cannot be borne by SMEs.

> *"There is a few fabric manufacturing plants in Sri Lanka but they are feeding only large manufacturers and when we want to buy from them the price is very high for us therefore it's cheaper to export" (Purchasing Manager- Case Study B).*

> *"We have some fabric manufacturers in Sri Lanka and their capacity is not very much to produce for the open market. They only do it for themselves and these plants are owned by large players and they only do knits not woven and we need lots of woven not knits so anyway we have to import them" (Purchasing Manager-Case Study C).*

This is a barrier external to these companies as shown in Figure 17 and if they are able to source fabric that complies with buyers' requirements within Sri Lanka, it would be enormously supported in further improving the garment manufacturing and exporting industry in Sri Lanka.

> *"...our buyers do not mind where we get fabrics from as long as they come under their requirements but the thing is in Sri Lanka, we don't have what we want" (Purchasing Manager-Case Study C).*

f) *Less Control over Suppliers*

Companies that work with buying offices have little control over their fabric suppliers as the fabric is always sent by the buyers:

> *"We have no option in the case of suppliers because most of the times we deal with buyer nominated suppliers" (Managing Director-Production-Case Study F).*

Buying offices also support this together with 'less successful' companies providing 10 coding references in total which is higher than the coding references occurred from 'more successful' companies (Table 23).

The delivery dates are informed when the order is confirmed, however in many cases fabric is not received in time to meet the delivery dates and eventually the manufacturer will be black marked. The same scenario applies with buyer-nominated accessories suppliers as well. An aspect of the buyer-supplier instruction that is not prominent in the data is that buyers are only partially responsible for the quality of raw materials that are sourced from the buyer-nominated suppliers. The companies that work directly with buyers carry out FOB and NFE orders of their buyers. Irrespective of which kind of an order it is, more than 70% of the buyers nominate the suppliers for fabric and some of the accessories. The highest coding reference for this theme was appeared from the Case Study A (n=5) shown in Table 23 and the reason can be that this company has to go through intermediaries to buy fabric. Trim cards should also be sent to buyers for the approval of the quality of raw materials even though they are purchased from the buyer nominated suppliers. In the case of delays due to

poor supply performance, buyers do not interfere to speed up the process. The buyers' argument is that the order is placed with the manufacturer so it is them who should monitor performance, rather than the supplier. However, buyers are not willing to damage the relationship with these suppliers so it is consequently the manufacturer which suffers leading to delays in the production process.

> *"...for our FOB orders they nominate the suppliers whom they have a good relationship with ...because they make huge savings with the effective supply chain having among them and consistency of the business operations with the same partners...we face many difficulties as a result of being a third party between them..."(Managing Director-Case Study A).*

The lack of fabric base within Sri Lanka has been the main reason these companies to work in a buyer nominated market and these are the barriers external to these companies as presented in the Figure 17. Working in buyer controlled markets has been indicated to have less control over the suppliers.

g) *Limited Machine and Staff capacity*

The CAD system is not present among the 'less successful' companies whereas it is fully implemented in the 'more successful' companies. This is supported from Table 23 (n= 17 coding references) where 'less successful' companies and one buying office to support this fact. However, 'less successful' companies receive designs for all the sizes of the garments from buying offices. The usage of CAM is limited among all the companies both from 'more' and 'less successful' companies. The substantial cost involved in implementing these systems has been the main reason for this. CAD and CAM systems increase the efficiency of manufacturing and designing through the speed and accuracy of the operations carried with these machines. Back up machines are available only for the machines that carry out basic sewing operations but sophisticated sewing operations not are carried out, again due the cost of funds. The list of machinery was documentary evidence for this together with interview data (Appendix U). This results in time losses taken to repair these sophisticated machines instead of immediately replacing them.

"Of course as SMEs we don't have enough resources as large companies do so we are not in a position to use computerised machines 100% but we have machines with certain functions computerised"(Managing Director-Production-Case Study F).

"...we have only a few machines supported by computer technology... these kinds of stuffs are not easy for SMEs like large scale companies" (Purchasing Manager- Case Study C).

All of the case study companies carry out the business operations with less staff and machine capacity due to the lack of funds. As depicted in Figure 17 less profit earned from low margined niches leads to a weak resource base available for these companies to invest. These companies have a very limited negotiating power in determining price so the margins remained low while cost of manufacturing are higher. As such, lower profits equate to a lower investment in new resources. Unavailability of skilled staff has resulted in the absence of ERP, MRP, 5S and JIT especially with the companies that work with buying offices. If these companies were able to implement these techniques it would have resulted in saving the time taken to manual information handling throughout production planning and operations thus shorter lead times would also have been possible.

"...for JIT we don't have a capable staff here to initiate and carry forward" (Managing Director- Case Study B).

h) Relatively Lengthy Supply Chains

Buying offices play a key role between buyers and manufacturers. Buying offices located in Sri Lanka are the local agents for foreign buyers. The case study companies from 'less successful' category must work through buying offices for every decision whether it be major or minor. This is evident from the coding references that only occurred from these companies and buying offices (Table 23). There are also numerous documents being sent between buyers and manufacturers that compulsorily pass through buying offices. Handling all communication and correspondence which is a requirement for these companies almost doubles the time taken for each decision. On certain occasions these companies have waited

a long time to receive decisions from buying offices. The functions from the point of order confirmation to the despatch of final goods must be channelled through the buying office. Even containers and vessels are arranged by the buying offices along with the communication of buyers and freight forwarders and informed to the manufacturers. However, depending on buying offices to make every decision has made these companies suffer at times:

> *"Sometimes they nominate certain vessels to ship the goods and we have documents for these vessels ... Then when the goods are ready or sometimes when they are gone to the port they say vessels are bypassed or no space. It has happened, and then we have to change the documents to different vessels to ship them next vessels possible..." (Managing Director- Marketing and Administration - Case Study F).*

Payments for the shipped goods also received via buying offices, generally take up to two weeks following shipment. However companies E & F have found many circumstances in which payments have been delayed for more than a month.

However, due to the lack of finance and other resources most of the SMEs do not have any alternative other than working with buying offices to survive in the industry.

> *"...especially the manufacturers in the SME sector have limited amount of facilities and financial restrictions and the number of people they can hire is also limited. If they want to work with their own buyers they have to handle their own marketing personnel and designers, alliance with buyers, and somebody has to in contact with buyers constantly which are additional investments so what happens in that case is they chose to work with buying offices..." (Managing Director - Buying Office 1).*

Figure 18 shows the generic supply chain network structures of the companies work with buying offices. Manufacturers are obliged to share all the information relevant to orders whereas buyers or buying offices do not share any information with manufacturers so

information sharing in the supply chain is clearly uni-directional. This has been caused by the factors: a lack of resources; the lack of business vision; and resistance to business risk shown in Figure 17.

Figure 18: A Generic Supply Chain Map for the Companies Work through Buying Offices

Tier 2suppliers **Tier 2 Customers** **Tier 1 suppliers**

and customers

Buyers in the UK, USA and Portugal		
Fabric and accessories suppliers in Taiwan, China and Pakistan	Buying office	**Case Study F**
Buyers in the UK		
Fabric and accessories suppliers in China and India	Buying office	**Case StudyE**
Buyers in the UK		
Fabric and accessories suppliers in China and Hong Kong	Buying office	**Case StudyD**
Local accessories suppliers		

⟶ Finished products, raw material and finance flow

----▶ Information flow

183

i) Top -Down Management

Organisation charts reviewed (Appendix V) for this research show a top-down hierarchy of management which reflects that bureaucracy is maintained to a great extent among all of these companies. The coding references being available from all these companies indicate this (Table 23). Every decision should be made by senior management, irrespective of its level of importance. Production staff are involved in pre-production meetings only for the purpose of circulating the details of new orders. However, decision making is strictly with senior hierarchical employees so even when a slight problem appears, a solution is delayed until senior management are notified.

> *"Decisions are only made by the key people. We get the involvement of the majority of people only for the pre-production meetings and thereafter the senior people are responsible if there is a downturn" (Managing Director-Production- Case Study F).*

Case Study B has found that the decisions made by line supervisors and production staff have been erroneous so they are not permitted to make some production-related decisions.

> *"... line supervisors and production workers sometimes make their own decisions but most of the times they are not very right... it makes the problem worse..."(Managing Director- Case Study B).*

The lack of business vision of the entrepreneurs and management have inhibited the creation of a productive organisation culture and working environment to achieve efficiency and effectiveness and this is better reflected in the Figure 17 as a barrier internal to the companies.

4.3.2 Constraints Faced in Relation to the Value Addition of Products

The parent node of value addition-related barriers consisted of seven sub-themes and patterns supported by the interview and documentary data, namely: high range of products; inadequate customer order path management; insufficient employee training; lack of innovations and high product development times; no control over fuel, import and export charges; less effective in managing logistics cost; and small quantity orders. Table 24

includes the number of coding references from interviews and documents obtained from the matrix query run for the parent node of value addition related barriers upon which these child nodes of sub-themes and patterns were developed. While most of the constraints are evident from the coding references made from 'less successful' category the sub-theme of 'small quantity' is supported only by the data from 'more successful' companies. The relationship between the parent node and child nodes is also presented in a model (Appendix W).

Table 24: Node Matrix-Barriers to Improve Value Addition of the Products

	Case A	Case B	Case C	Case D	Case E	Case F	Case 1-Buying office	Case 2-Buying office
1 : High range of products	0	0	0	1	1	2	0	0
2 : Inadequate customer order path management	0	0	0	2	2	1	1	0
3 : Insufficient employee training	0	0	0	4	3	4	0	0
4 : Lack of innovations and high product development times	0	1	1	6	3	4	0	0
5 : No control over fuel, import and export charges	2	3	1	4	1	4	0	0
6 : Less effective in logistics cost management	3	5	2	5	6	5	0	1
7 : Small quantity orders	6	1	1	0	0	0	0	0

a) *High Range of Products*

Case Studies D, E and F are from the 'less successful' category in terms of the implementation of effective SCM strategies. These companies' value added per employee is low and lead times are longer compared with the 'more successful' companies. The range of products manufactured by Case Studies D, E and F are also broader than that of the 'more

185

successful' companies which is evident from the coding references being appeared only from these companies as presented in Table 24. Case Study D manufactures all kind of ladies' items: trousers, shorts, blouses and skirts including undergarments and Case Studies E and F; all types of ladies', men's and children's wear. The lack of strategic thinking and business vision in Figure 17 is the reason behind the inability for these companies to organise an effective range of products.

b) *Inadequate Customer Order Path Management*

The companies that work with buying offices totally depends upon the buying offices' orders and buying offices hold the right over the selection of companies for their orders. This is done through a compliance audit carried out by buying offices. Manufacturing process of these companies is started when an order is confirmed by the buying offices. Once the order is completed it is shipped in the container and vessels nominated by buying offices thus these companies are highly dependent upon and controlled by buying offices. They are not aware of anything outside their factory operations such as the steps an order passes through before reaching them. This factor is evidenced in the coding reference data that have only appeared for the 'less successful' companies and one buying office, as shown in the Table 24. Management of these companies are well aware of these steps and whenever a bottleneck appears they interject immediately to bring the process back to normal. However, none of the companies are aware of the channels an order receives and passes back to the buyers. They have a limited control over the supply chain as a result of working with foreign buyers' intermediaries. This results in the avoidance of understanding the time an order spent in different routes of the supply chain which also includes the elimination of non-value adding activities:

> *"I am aware of everything inside the factory because I am updated every day of daily production issues. But before it comes to the factory and once it is loaded in the ship, in the vessel that the buyer needs, I am not aware of anything beyond that point" (Managing Director-Case Study D).*

The lack of resources depicted in Figure 17 has caused these companies to work with buying offices resulting in an inadequate customer order path management.

186

c) *Insufficient Employee Training*

The management of Case Studies D and E are not satisfied with the productivity of sewers:

> *"There are a certain percentage of sewers that I am not happy with ..." (Managing Director-Case Study D).*

Nevertheless the 'less successful' companies have not made any effort to offer training for them to improve efficiency. Coding references were only appeared from 'less successful' category to evidence this theme as can be observed from Table 24. This is due to the lack of business vision or strategic business thinking of the management of these companies shown in Figure 17. Less efficient workers cost time and resources thereby detracting from the value of the products. Only about 10% of the staff can perform multi-functions and the lack of time and the nature of organisational culture have been the reasons behind this:

> *"Only a very few of them can do multi functions and it is around less than 10% and even to improve this rate we haven't got enough time to train them ..." (Managing Director- Case Study D).*

> *"...we attempted to train but we find most people resisting and only a very small number of people are ready to do so…" (Managing Director-Case Study E).*

The consequences of not having a trained staff on multi functions, has included the unexpected resignation of employees who are specialised in functions that need skills that not every employee cannot perform.

d) *Lack of Innovations and High Product Development Times*

There were no coding references from Case Study A to substantiate the theme of the lack of innovations and high product development times, as it manufactures company owned brands with constant design changes. Case Studies D, E and F are not involved in new product development as indicated in (n=13) coding references from these companies (Table 24) as their sole business purpose is to manufacture the orders received from buying offices. Case Study B and C do not either as indicated in 1 coding reference from each, even though it contacts its foreign buyers directly so the value added to the final products remains low. These companies only manufacture the foreign buyers' labels and struggle to develop their

own brands due to low control over the market. The product development times also appear high among the companies that work with buying offices. On average SMV has been higher among these companies than that of 'more successful' companies which might not again add any value to the products. The expected efficiency rate of a sewer is determined based on SMV. The narrow range of products manufactured by the 'more successful' companies has helped in achieving higher employee efficiency rates and by contrast, the broader range of products with 'less successful' companies have resulted in high product development times and low efficiency rates. For these companies, developing a realistic product range has not been possible due to the lack of strategic business thinking (Figure 17). Fashion garment designs have a large variation which makes sewing staff require extra time to be familiarised with new designs so product development times become higher with no value added to the products:

> *"...sewing girls need some time to get familiarised with the design to improve efficiency…" (Merchandiser-Case Study E).*

e) *No Control over Fuel, Import and Export charges*

Shipping charges are lower with regard to the companies that work with buying offices than those of the companies work directly with buyers. Foreign buyers send fabric and book the containers for sending back the finished goods at their cost whereas the companies that work with direct buyers have to absorb these costs themselves, especially with their FOB orders. Continuously rising fuel prices have been a common reason for both types of companies wanting to control logistics costs. More than 80% of the raw materials (fabric and accessories) are imported and therefore the cost involved in import and export charges, custom duties and shipping charges are very much higher and they are fixed, thus these companies have no control over them. Moreover these charges do not contribute to the value added of the finished goods:

> *"Obviously the huge cost on import and export charges does not add any value and its better if we can source them locally…" (Purchasing Manager - Case Study B).*

"...higher import and export charges are fixed and we have no control over them...about 80% of raw materials are imported and dyes and chemicals are also imported. We manufacture the garments and then export ...now the buyers are not ready to pay our simple price because our cost is going up and there is a marketable price..." (Managing Director - Case Study A).

This is a barrier in common which is completely external to the companies shown in Figure 17. The coding references found in Table 24 support this were available from all the case companies. However, they have negotiated with the relevant authorities to claim tax and duty exemptions especially for SMEs but it has still not been very successful at present.

f) *Less Effective in Logistics Cost Management*

None of the case companies are aware of the percentages of the components of logistics cost: transportation, information processing, inventory and new product development which was evident from the coding references available from all the companies to support this theme (Table 24). The highest coding reference of 6 was observed from Case Study E which is a 'less successful' company. These companies could only provide an estimation of costs when questioned:

"What is the information processing cost as a percentage of total logistics cost?

We haven't calculated but it should be very low as we use our ERP system. ... when we have to deal with our suppliers and buyers ...we use emails (Managing Director-Case Study B).

To be very honest we have not calculated it but it should be very less because we are using only our ERP system and emails so it should be very, very small (Purchasing Manager-Case Study C)".

"What is the logistics cost as a percentage of total cost?

We haven't measured it but it should be anything around 5-10%" (Managing Director-Case Study E).

189

Case Studies A, D and E had not thought about the probable virtues of minimising logistics cost:

> **"How do you attempt to reduce the logistics cost?**
>
> *Not in a very big way. To be very frank we have not measured it to a very great extent. Normally, we do certain things within our costing and we check whether it is within those…that's all" (Managing Director-Case Study A).*

On average raw materials and work in progress stocks tend to stay in the stores for about one to two months and these inventory costs would not add value to the finished products. Sending fabric very early by the buying offices before the confirmation for cutting fabric has been another major problem for the companies work with buying offices as they find it difficult to maintain these stocks when they do not pay back with anything:

> *"… they send us fabric very early sometimes even before two or three months. Sometimes fabric comes but we don't know for what. Actually it's an additional cost keeping them at our stores" (Managing Director-Case Study D).*
>
> *"...there were certain situations fabric and accessories were sitting here for nearly three months without any confirmation for cutting from the buying office … it's a huge loss for us…" (Managing Director- Marketing and Administration- Case Study F).*

There have been certain times when buying offices send fabric meant for another factories' orders and then it becomes a responsibility of that factory to clear these fabric stocks which again utilises a certain capacity of their stores along with an increased cost. However, this has happened relatively infrequently and it cannot be seen that these companies have taken any measure to avoid these conditions. An internal barrier of the lack of strategic business thinking shown in Figure 17 is the main reason behind this situation.

g) Small Quantity Orders

This is a theme evident from 'more successful' firms as all the coding references found in Table 24 were from these companies. This theme was more noticeable from Case Study A as

can be seen from the highest coding reference of 6. Small quantity orders have restricted these companies achieving economies of scale. Order confirmation sheets, purchase orders and invoices (Appendices K and L) support the fact that less than 1000 pieces orders are the most frequent and less than 500 pieces are also received by these companies. The cost of production therefore has been considerably higher. Especially the companies working directly with buyers are responsible for sourcing fabric and other required accessories by themselves in relation to their FOB orders. Case Studies A and B have found that small quantity FOB orders cost them extra almost in every function of: shipping in raw material and shipping out finished goods, production operations and purchasing packing material. The situation has been worse when design variations are also higher with small quantity orders so achieving supply chain efficiencies have been eluded:

> *"...when it comes to packing we have to order the packing materials too in smaller quantities so it becomes a bit expensive because that packing material guy also has to produce them in smaller quantities. As bigger the production run, smaller the variations and higher the cost savings. But we get smaller runs and sometimes we find bigger variations too so we are vulnerable in terms of supply chain efficiencies. As a result shipping the goods will also become costlier so being very frank the cost between a bigger FOB and a smaller FOB is miles apart..." (Purchasing Manager - Case Study A).*

It has been further found that small quantity orders are also a reason for these companies being unable to effectively control logistics cost, which coupled with low efficiency levels of sewing staff results in low value added to the products. Quantities are inadequate for sewers to be familiarised with the designs of the orders coming up with a new design with every order:

> *"...since they are small orders before the sewing girls hit their peak they get finished but sewing girls need some time to get familiarised with the design and improve the efficiency so they need to be a bit bigger order..."(Purchasing Manager-Case Study A).*

However, the lower monthly production capacity (from documentary evidence of company profiles support this fact- Appendix X) available in SMEs has been the reason for them to be selected for only smaller quantity orders as large firms are not interested in smaller quantities. These markets are probably the less profitable niches neglected by large firms:

> *"...we work with smaller orders ...we normally do some uniforms for certain super market chains because they have smaller orders of which the big players are not too interested…" (Managing Director - Case Study B).*

The lack of fabric found in Sri Lanka increases the cost of production and therefore garment manufacturers have to work in a buyer-nominated market so mostly they have been selected for low profit margin niches with smaller quantities. This barrier is a result of targeting low profit margined niches that is shown in Figure 17.

4.3.3 Constraints Faced in Relation to the Direct Contacts with Foreign Buyers

he lack of resources and required compliances, less effort made to reach direct buyers, not being ready to accept business risk and poor business relationship with buying offices are the reasons for these companies to work only with buying offices. At present, they are unable to initiate working directly with foreign buyers. These themes and patterns emerged as the sub-themes under the main theme of direct contacts related barriers through the evidence of interviews and gathered documents. The results of the matrix query run for the parent node of direct contacts related barriers are shown in Table 25 and the identified reasons are explained below. These reasons emerged only from the coding references from 'less successful' companies and buying offices. A model which represents the association between the parent node and child nodes also was generated (Appendix Y).

Table 25: Node Matrix-Barriers to Establish Direct Contacts with Foreign Buyers

	Case A	Case B	Case C	Case D	Case E	Case F	Case 1-Buying office	Case 2-Buying office
1 : Lack of resources and required compliances	0	0	0	9	2	6	2	2
2 : Less effort made to reach direct buyers	0	0	0	1	2	1	2	0
3 : Not ready to accept business risk	0	0	0	1	2	1	1	1
4 : Poor business relationship management with buying offices	0	0	0	10	6	6	0	2

a) *Lack of Resources and Required Compliances*

This theme is supported by buying offices as well showing coding references to be emerged (Table 25) and these companies rely on buying offices' resources to continue business operations. The reasons behind the inability to implement of CAM, CAD, JIT, RFID, MRP, ERP and 5S for the companies that work with buying offices are the lack of funds and skilled staff. Even the buying offices carry out comprehensive compliance audits in terms of the aspects: list of machines, area of production floor, average output per line, fabric handling capacity, material warehouse, sewing and cutting section, finished goods warehouse, loading bay, and security. To ensure the factories meet the essential standards of compliances to qualify for foreign buyers' orders. Therefore the major reason for these companies not being qualified to work directly with foreign buyers is their lack of resources and compliance which is an internal barrier (Figure 17):

> *"...because we can't easily buy or build as large companies. We are SMEs and we run our business with a limited range of resources...most of the SMEs are*

within the capacity of producing small quantities due to the machine and staff capacity limitations they've got. For this reason generally direct buyers go for big players…" (Managing Director-Production- Case Study F).

"SMEs running with less resources especially they have a limited financial capacity, limited staff, limited range of machines so if they have to find their own buyers and contact them regularly that will be difficult for them. Then they will need a separate marketing staff and also liaison officers that will be an additional cost for them. That's why these manufactures like to work with buying offices, it is less work for them and as well less risk" (Managing Director- Buying Office-2).

The tight cash flow has also been another reason for these companies to work only with buying offices. These companies only handle NFE orders, C and M (cost of cut and make) and CMT (cost of cut, make and trims) are the two types businesses that use the business model of NFE. If it is C and M, manufacturers are only paid for the cost of cut and make by buyers, but not the cost of trims (labels, hangers, poly bags, trims) and in the type of CMT cost of cut, make and trims should be borne by manufactures and CMT cost will be paid by buyers. However, these companies request buying offices to pay for trims as well, even it is C and M type of business due to the cash flow problem they experience:

"They provide us also hangers, which means that we order them and they pay because we can't afford spending for them. Even for labels they do the same. What happens finally is they deduct this expenditure from our final payment…we don't do FOB because I have to mange to pay for everything and sometimes we get cash flow problems" (Managing Director- Case Study D).

b) *Less Effort Made to Reach Direct Buyers*

The companies that work with buying offices have not made any effort to work with direct buyers. One buying office proved this factor by particularly explaining this condition as shown coding references to appear in Table 25. They are aware of the missions organised by the SLCGE (Sri Lanka Chamber of Garment Exporters) and EDB (Export Development Board) which is a platform for buyers and manufacturers to meet. However, it can be seen

that they have even not shown any interest merely because of the early assumption of that they are not in a position to meet the requirements of buyers:

> *"Sometimes SLCGE and EDB organise events to meet the buyers directly but then they ask for different compliance which we don't have... so we don't get orders" (Managing Director-Case Study D).*

These companies not being ready to accept business risk and poor strategic business mind-sets have confined them only to the business operation with buying offices (Figure 17).

c) *Not Ready to Accept Business Risk*

Only NFE orders are carried out by the companies that work with buying offices. In NFE orders, buying offices always provide fabric and certain accessories as well. Buying offices are easily accessible whenever these companies find problems with their payments; as a result, doing business with buying offices is less risky than working with direct buyers which involves a higher risk. However, these companies are not ready to accept the business risk to upgrade their businesses:

> *"We prefer to do business via buying offices although it is not profitable as doing direct orders ... in case of any problems we do have a responsible body here in SL to go and approach" (Managing Director- Production- Case Study F).*

They are also reluctant to accept FOB orders even though they receive them via buying offices.

> *"For FOB orders we have to pay for everything even for fabric and they should be bought from the nominated suppliers by the buyers anyway we don't do FOB orders because it's risky" (Managing Director-Case Study D).*

The perception that 'direct buyers are not trustworthy' has been another major reason for these companies not to initiate working with direct buyers:

"...they might pay for one or two shipments and they won't again, nothing as such happened to us because we don't take direct orders but there are certain cases known to us" (Managing Director-Case Study E).

"...I know personally some of them who did the container for their direct buyers are waiting for money to come from the buyer and there are cases where buyers haven't paid them" (Managing Director- Production- Case Study F).

However trusting the buyers does not appear to be a major problem if these companies are ready to accept the risk and additional cost for the potential benefits:

"When they have local representative of their buyers they feel much safe because they can reach somebody but it's not always the case, trust is also not that much of a big problem if they can afford the additional cost and risk" (Managing Director- Buying Office 2).

d) *Poor Business Relationship Management with Buying Offices*

Those companies that work with buying offices depend on them to receive orders and they are trusted as their business partners. However, it does not appear that they have a very good business relationship due to the lack of information sharing between buying offices and manufacturers. Case Study D showed 10 coding references for this theme which is the highest shown in Table 25 and the managing director was particularly dissatisfied with the problem solving aspect of the buying office. Manufacturers strongly believe that they are not solely responsible for the quality standards of raw materials and finished goods so they are not satisfied that the buying offices passing down the responsibility of defectives to the manufacturers:

"...in the case of buying offices we haven't got any big issue with them but we have noticed that they will not hold any responsibility of any defects even though they do their own quality checking of what we do" (Merchandiser- Case Study E).

196

"…the buying office can be trusted but in case any problem comes they will try to pass the mistake for us" (Managing Director- Case Study D).

However, the buying offices hold a different point of view of the same fact: they only perform a random quality inspection and it is only 10% of the products so if any defects found buyers should handle it directly with the manufacturers. They are not even responsible for the quality standards of the raw materials used for manufacturing:

"All manufacturers know how to check the accessories and it's not a duty of buying offices. It's a job of the manufacturers. Whenever buyers found a quality problem with fabrics or accessories they go back to the manufacturer still they keep informing us but it's not the responsibility of buying office…when the goods arrived in the final destination it goes back through whole thing to find out who inspected and how was inspection done and ultimately of course its manufacturer's responsibility and we are not responsible as such because we do only random inspection. Its only 10% of the products so it is ultimately manufacturers fault and we can't do the 100% inspection" (Managing Director- Buying Office 1).

"We do only 10% random inspection before shipping the goods and we are not required to do a 100% inspection which is known by buyers so in case they found quality defects they have to be sorted out with the manufacturers" (Managing Director- Buying Office 2).

The buying offices stated that they share all the necessary information which is relevant to the international fashion market and always support manufacturers in the case of any difficulties found:

"We always share information with our manufacturers and they are very much updated regularly about the recent trends, what the goods are, what the price will be, what is the plan of the company, buyers standards and stores standards…before the agreement of an order, everything is discussed and explained to the manufacturer… (Managing Director-Buying office 1).

Conversely the manufacturers stated that it is only the order related information provided by buying offices:

> *"...they share whatever the information we need in order to process the order..." (Managing Director- Case Study E).*

However, the disagreement between manufacturers and buying offices on quality inspection of raw materials and finished goods is evidence that even order-related information is not properly shared.

The informal business contacts have been able to prove the manufacturers that buying offices cannot always be trusted:

> *"...buying office that we are working with takes 60 days to pay back so it's a long time. It does not depend on the brand that we are manufacturing because there are different buying offices who handle the same brand with some other manufacturers...they get the payment within less than two weeks from the buying offices they work with and this is for the same brand...but the buying office that we are working with takes 60 days to pay back us...they say that that's how the buyer pay them but if that's the case how the other buying office can pay early ... this market is dominated by buying offices..." (Managing Director - Case Study D).*

These instances have discouraged companies from initiating business contacts directly with buyers. The opinion that these companies hold is when working with the local agents of foreign buyers has also been problematic, working directly with them anyway will create much more complications.

The barriers of being not ready to accept the business risk and lack of business vision which are presented in the Figure 17 have underpinned many of the barriers to implementing effective SCM strategies. These two internal barriers made these companies work only with buying offices which resulted in low profits. Low profits have made these companies' resources lower to invest. Therefore high range of products, relatively lengthy supply chains,

insufficient employee training and inadequate of understanding the customer order path can be identified as consequences of working with intermediaries.

Finally the matrix query run for all the case studies under each parent node summarised number of the coding references from each case study for each main theme. Table 26 shows the matrix node table. Except for the direct contacts related successful strategies all other main themes have been emerged with the support of data both from 'less' and 'more' successful' companies and buying offices as well. The evidence for direct contacts related successful strategies were only apparent from 'more successful' companies as 'less successful' companies do not contact their foreign buyers directly. Being 'more successful' companies does not mean that they are free of obstacles to improve SCM strategies and similarly being 'less successful' companies does not mean that they are absence of successful SCM strategies. Evidence for both successful SCM strategies and barriers were observable from all the chosen cases as evidence from the coding references emerging from all the cases as presented Table 26. Lead time related barriers are more obvious than others as confirmed by the highest number of coding references (178 coding references). Lead time relating to successful SCM practices also showed the highest number of coding references (n= 156) among the other success indicators of value added and direct contacts.

Table 26: Node Matrix for all the Case Studies Under each Parent Node

	Case A	Case B	Case C	Case D	Case E	Case F	Buying office 1	Buying office 2
1 : Direct contacts-barriers	0	0	0	21	12	14	5	5
2 : Direct contacts-Successful strategies	13	11	12	0	0	0	0	2
3 : Lead Time-Successful strategies	33	35	28	18	21	19	0	2
4 : Lead time-barriers	25	23	20	32	30	33	4	11
5 : Value addition-Successful strategies	18	15	22	11	10	10	0	2
6 : Value addition-barriers	11	10	5	22	16	20	1	1

4.4 Summary

This chapter has presented the findings of the research in relation to the themes and patterns emerging from the empirical data. The successful SCM strategies and constraints in implementing effective SCM strategies of garment manufacturing and exporting SMEs in Sri Lanka were discussed along with the themes and patterns stemming from interview data and documentary evidence. Lead time, value addition per employee and the absence/presence of direct contacts with foreign buyers were the criteria employed to understand successful strategies employed by the chosen case study companies in terms of implementation of effective SCM strategies so it was felt logical to organise the themes and patterns on these three factors. Not all successful SCM strategies were evident from 'more successful' companies and neither all the constraints in implementing effective SCM strategies were available, only from the 'less successful' companies. It was a combination of data from both

categories of companies and most surprisingly there were some successful strategies more prominent from 'less successful' companies than the 'more successful': such as high quality of products. Further the lead time barriers appeared among the barriers of value added and direct contacts. Lead time related success indicators were also more apparent than other two success indicators of value added and direct contacts related.

Chapter 5: Discussion

5.1 Introduction

Whilst Chapter 4 detailed the successful SCM strategies that have been implemented by the case companies, as well as the constraints faced in implementing effective SCM strategies, this chapter discusses the research findings in relation to both the literature discussed in Chapter 2 and additional literature that was sought to understand unexpected themes that emerged from the research.

The discussion of research findings are grouped around two key themes that focus on the research questions: firstly, in relation to the successful SCM practices found in garment manufacturing and exporting SMEs in Sri Lanka; and secondly, the constraints faced by garment manufacturing and exporting SMEs in Sri Lanka in implementing effective SCM strategies. Both the key themes are sub-organised in relation to the three main factors of lead time, value addition and direct contacts that were considered for the research to define the level of successfulness of SCM strategies that have been implemented. Finally, efforts are made throughout this chapter to understand the factors that facilitate the efficient functioning of effective successful SCM strategy in a Sri Lankan garment manufacturing and exporting SME which is also an objective of the research. This objective will be achieved in the light of previous literature together with the findings of this research. This chapter will also be based on the results of advanced coding queries that were run in Nvivo 10 in relation to successful SCM strategies and barriers to improve existing SCM strategies. Advanced coding queries facilitated in understanding the common factors that supported more than one theme and will be taken into account wherever relevant.

5.2 The Successful SCM Strategies in Sri Lankan Garment Industry SMEs

In reviewing the literature, no studies were found to have been carried out in the Sri Lankan context on the question of identifying the successful SCM strategies implemented within the garment manufacturing and exporting SMEs. This research is an attempt to fill this knowledge gap and identify the indicators of successful SCM strategies which are discussed in the light of previous research findings. Except effective cell layout planning, successful

uncertainties management and high emphasis on teamwork which are evident from both 'less' and 'more successful' companies, the rest of the successful SCM indicators are apparent only in the 'more successful' category. It seems possible that these results are due to the fact that, the 'more successful' companies benefited from a virtuous circle (Figure 19) of higher value added per employee, shorter lead times and direct contacts with foreign buyers who then generated resources to invest in ERP, MRP, CAD and CAM so, in turn, yield further benefits. Moreover the successful strategies related to lead time and value added are mere indicators of internal supply chain efficiencies. The reason behind this is the lack of control over the external supply chain as the market is dominated by foreign buyers. The successful strategies can also be considered as strengths of these case companies.

Figure 19: Virtuous Circle of Higher Value Added per Employee, Shorter Lead times and Direct Contacts
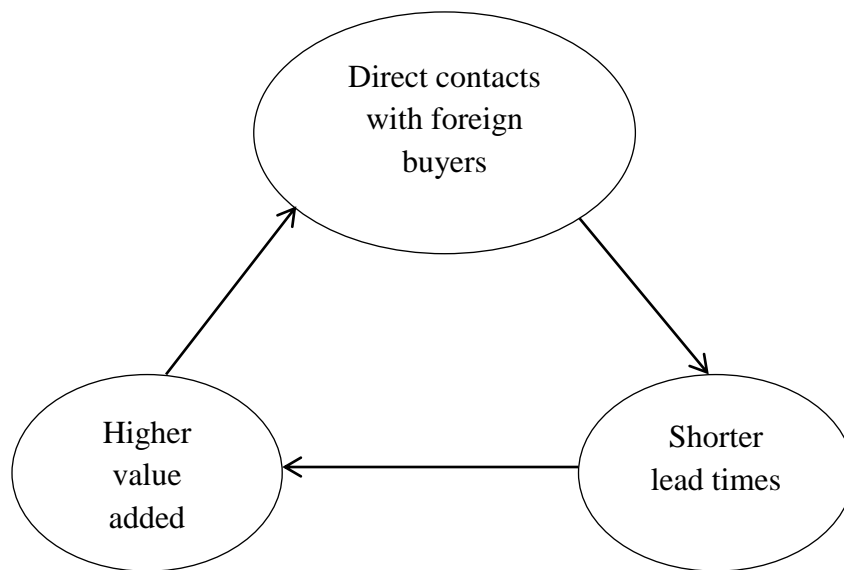
5.2.1 Lead Time Related Successful SCM Strategies

Overall, it was found that reducing lead times depends to a large extent on manufacturers' relationships with buying offices and first-tier suppliers. However, there are specific strategies and operational procedures that are employed by the firms for reducing leads times. High emphasis on team work, relatively shorter supply chains, implementation of 5S, effective cell layout operations planning, effective scheduling techniques, implementation of CAD and CAM, successful uncertainties management and strong mutual understanding in

the supply chain are the sub-themes identified from the data that contribute to short lead times. Each of the factors is now discussed with the light of academic literature.

a) Emphasis on Team Work

All the companies chosen for the research, plan manufacturing operations on a production line system with a team of multi-functioned employees such as sewers, quality checkers ironing packing and workers. However, multifunction employees are broadly encouraged among the more successful companies and more than 50% of the employees are able to perform multi functions which are again a part of team work (Rose *et al.,* 2011). Cross-functional teams with multi-skilled employees effectively reduce the order lead time and staff redundancies (Schonberger, 1990) which helped in improving the value addition of the products as well. Production lines are assigned with targets and it is their responsibility to achieve the targets irrespective of team-absenteeism. If any team completes its target while some other teams are still running the operations, the team already finished the target immediately attends to supporting other teams to complete their targets so the occurrences of down-time are minimised. Minimising waste is a focal feature of lean including time (Naylor *et al.,* 1999).

Team work as a concept is more prominent among all the companies from the 'more successful' category and has contributed to shorter lead times compared with other companies. It seems possible that teamwork reduces lead time due to the fact that working on a team tends to save time as all the people in a production line should complete their tasks at a similar speed to avoid the delays of subsequent operations of production line. This finding of the current study is consistent with those of Hamilton *et al.* (2003) who found that working in teams tends to save time due to the co-ordinated approach to work rate and task completion in garment manufacturing plants which is again a common lean manufacturing practice in SMEs (Rose *et al.,* 2011).

b) Relatively Shorter Supply Chains

Shorter and more manageable supply chains tend to have shorter lead times (Treville *et al.,* 2003). The 'more successful' companies bypass one step of the supply chain which is working with the intermediaries of foreign buyers' local buying offices. They achieve

efficiencies by working directly with their foreign buyers and suppliers so these companies' supply chains are shorter than the 'less successful' companies. Even though the existing literature (Tirimanne and Ariyawardana, 2008; Kelegama, 2009; Kelegama, 2005) acknowledge that the Sri Lankan garment industry is disadvantaged due to the limited contacts with global buyers, it is somewhat surprising that none of these authors have explored this condition substantially in terms of reducing lead times. The results of this study did show the significance of having direct contacts in many ways that largely facilitate shorter lead times:

- A faster decision making process has been possible as they can directly approach the buyers whenever problems arise,
- Information is shared between supply chain members even if it is limited so problem solving is faster,
- Although considerable information exchange occurs between the buyers and 'more successful' companies when carrying out an order (see Section 4.2.1), the time needed to make every decision through a buying office is saved compared to the 'less successful' companies,
- 'More successful' companies source fabric within a shorter time than 'less successful' companies. 'More successful' companies need about two or three weeks on average to source fabric as they have to purchase them mostly from the buyer nominated suppliers. The 'less successful' companies that work with buying offices receive fabric from buying offices which is beyond their control and at many times they receive fabrics too early or very late.

Although the importance of shorter supply chains is discussed in the past literature, however it attributes a significant importance to the Sri Lankan garment industry as the lack of direct contacts is a factor that whole industry has made vulnerable so it is a critical for the success of the industry (Tirimanne and Kelegama, 2009; Kelegama, 2005).

c) *Implementation of 5S*

Only one company from the 'more successful' category make an effort to implement 5S as it has been able to identify the impact that can be made towards achieving shorter lead times and higher value addition (Hari *et al.,* 2012; Gunasekaran *et al.,* 2000). Implementation of 5S sustains the neat daily operations and minimum resource wastages thus the shorter lead times and higher value additions are possible. Another company from 'more successful' and one from 'less successful' category partly implement 5S.

The company from the 'less successful' category however does not meet shorter lead times even though it partly implements 5S. A possible explanation for this might be that the time saved by partly implementing 5S does not make any substantial impact as the time wasted as a consequence of depending on buying offices is considerably long.

5S is a low cost lean management practice that can be easily implemented by SMEs as it requires fewer resources (Rose *et al.,* 2011). However, the findings of the current study do not support the previous research as 5S is not fully implemented among the case companies except Case Study A. The lack of management commitment inhibits reaching the benefits of a properly implemented 5S system in these companies corroborating the ideas of Achanga *et al.* (2006): leadership and management commitment are the most critical factors for the successful LM implementation in an SME. Therefore a minimum level of 5S implementation is apparent among five case companies of the sample.

d) *Effective Cell Layout and Operations Planning*

A fixed machine layout is not evident among any of the companies and it depends on the design of the garments. Every type of garment requires different operations so a fixed layout of machine is not possible to maintain. And also the best machine layout is chosen as a result of feedback obtained from the pre-production meetings and small scale sample production runs thus time wasted in choosing the best layout for an order is maintained at a minimum. The sample runs have largely dictated the positioning of machines for the correct order manufacturing operations which again avoid time lapses in the middle of the production process. The different viewpoints obtained from supervisors, quality controllers and mechanics are further supporting this as the different aspects of the machine layout can be

obtained from different personnel related to manufacturing operations so it would lead to the most efficient machine layout saving time and resources. Waste from motion and waiting is minimised through the process of effective cell layout designing as these companies do not wait until the existing production run completely finishes to set the layout for the next production and being careful to select the perfect cell layout ensures the minimum waste of motion as well. Waste of motion and waiting are the features of the implementation of leanness as acknowledged by Toyota Production System.

For reducing lead time, cell layout (Rose *et al.,* 2011) and machine/tool set up time (Rose *et al.,* 2011: Gunasekaran *et al.,* 2004) are recommended lean practices for SMEs and understanding of work cell concept by both shop floor and office employees (Suri, 1998). These companies have been successful in saving time when changing to a new machine layout which is an indicator of a flexible supply chain (Gunasekaran *et al.,* 2004) as a result of pre-production meetings and sample runs. Scheduling for shop floor control in a production environment is particularly important for the textile and clothing industry to reduce the wastage of resources as it is compounded with small scale companies (Bruce *et al.,* 2004). Shop floor control is a broader concept and the companies chosen for the research at present implement only cell layout and reduced machine/tool set up time practices that can be considered as ground work for implementing a proper shop floor control system leading to understand value adding and non-value adding activities in a shop floor environment (Gunasekaran and Lyu, 1997).

Visual control is also another lean manufacturing practice recommended for SMEs (Rose *et al.,* 2011) however it is not a common lean practice among the case companies. Nevertheless it cannot be seen from empirical data that the absence of visual control has made a substantial effect on delaying the production process as the link between the factory and management is based on continuous and prompt updates from management (in relation to the factory operations so whenever bottlenecks appear they are solved immediately).

CAD is fully implemented and CAM is partly only by all the companies in the 'more successful' category. CAD supports in achieving shorter lead times due to its speed in designing and grading the garment designs for different sizes of the same design. CAM also

saves time by avoiding man-handling of materials and meeting higher accuracy levels and speed of the manufacturing operations; these are essential in order to successfully implement QR (Perry and Sohal, 2000). These techniques facilitate fast information processing in the supply chains which leads to reduced lead times (Suri, 1998). Apart from QR, collaboration is another key factor to implement agility as it facilitates virtual enterprise (Yusuf *et al.,* 1999). Sub-contractors for large companies are a successful way of collaborating for SMEs to implement agility. However the findings of current research have been unable to demonstrate this condition, even though all 'more successful' case companies carry out sub-contracted orders of apparel giants in the country. The reason might be that the case companies are mere external manufacturers for the apparel giants to sub-contract orders beyond their existing capacity.

Implementation of a fully automated manufacturing system has been not been possible to achieve due to the exorbitant cost involved in these processes.

e) *Effective Information Management Techniques (ERP, MRP)*

Both ERP and MRP are implemented by two companies from the 'more successful' category whereas one company implements only ERP and small production runs are the barrier to optimise the production flow with the implementation of MRP. Scheduling techniques of ERP and MRP can reduce throughput time and improve efficiency in purchasing functions (Gunasekaran *et al.,* 2001; Gunasekaran *et al.,* 2004) by which lead time also can be minimised. Small production runs of these companies are understandable as SMEs own only limited manufacturing capacities due to the lack of resources. However none of these systems are connected with external parties so are only implemented to achieve effective information handling and production movement planning of the internal supply chains while emails are used to contact suppliers and buyers. The lack of control over the supply chains as these companies function in a foreign buyer-nominated market can be seen as the restricting factor to link ERP and MRP systems with their buyers and suppliers. However, the inability to connect these systems with buyers and suppliers has inhibited achieving the overall effectiveness of ERP and MRP systems. Besides, SMEs are less likely to invest in advanced information management techniques (Levy *et al.,* 2002).

The implementation of ERP and MRP techniques has led these companies to be efficient in terms of minimisation of the time taken to schedule information and maximising the effectiveness of internal resource flows. The accuracy and speed of information flow in an apparel industry supply chain is important (Chan and Chan, 2010) and Quick Response (QR) is an operations strategy for achieving this (Lowson *et al.,* 1996). Certain aspects of QR are evident among the chosen SMEs that facilitate fast information processing in the supply chains which leads to reduced lead times (Suri, 1998). These include:

- Organising sewing machines into modular sewing cells (Perry and Sohal, 2000) because production operations are carried out in line systems, of which machines with different functions are organised in one line,
- Careful selection of suppliers (Chan and Chan, 2010) in terms of reliability and they are regularly evaluated for better performance,
- CAD, CAM and MRP are implemented especially within the 'more successful' companies which are essential in order to successfully implement QR (Perry and Sohal, 2000)

These companies were identified as the 'more successful' companies due to their higher value addition per employee; shorter lead times and they maintain direct contacts with foreign buyers. Annual turnover is also higher among these companies and higher profit margins are made as a result of working with direct foreign buyers which have been a reason for these companies to be financially capable of afford the cost of implementing the techniques of ERP and MRP. None of the companies that work directly with buyers or through buying offices forecast demand and production operations are planned once the direct order is received from either the direct buyer or buying office; this helps to maintain the order entry time at a minimum so shorter lead times are possible (Gunasekaran *et al.,* 2004). However it is not evident that this factor has made any noteworthy contribution to lead time reduction among the companies that work with buying offices and delaying the whole production process due to the over-dependence on buying offices prevent achieving shorter lead times.

f) *Successful Uncertainties Management*

Flexibility in terms of volume and design variations, machine breakdowns, poor supply performance and moving forward planned delivery dates were the uncertainties especially considered in the present research. Flexibility is an important factor to improve the overall efficiency of a supply chain (Beamon, 1999) and an important feature of agility (Poolton *et al.* 2006) and an important intangible asset in SMEs which combines the advantages of speed of response, ability to innovate and capacity to adapt (Feigenbaum and Karnani, 1991). Volume changes are quite common with the companies from 'more successful' companies and quantities beyond the existing capacity are rejected. The companies work with buying offices hardly find quantity changes as in general the agreed quantity at the time of order confirmation is fixed. Even if it is changed, revised delivery dates are negotiable with buying offices. The strong mutual understanding that has been cemented with each other among both 'more' and 'less successful' companies is a reason for these companies to negotiate with foreign buyers and buying offices thus successful uncertainties management has been possible. However accommodating quantity changes was not possible without revised delivery dates so volume flexibility (Beamon, 1990) is not apparent to a great extent among the chosen case studies. The reason behind the inability to be fully flexible with volume changes is the limited capacity of these companies, as a consequence of being small in size. Design variations are apparent especially with the companies that manufacture fashion garments. Past experience working with different designs has largely contributed to these companies managing unforeseen change effectively without significant time losses. So, mixed flexibility (Beamon, 1990) is practiced to a higher degree especially among the companies that manufacture a higher range of fashion garments. To minimise the time losses due to machine breakdowns, these companies have taken several measures: preventive maintenance of machinery, keeping back-ups only of low-cost basic machines and employing skilled mechanic staff for immediate attendance of repairing especially-sophisticated machines as keeping back up machines for them is costly. This can be seen as an effective way of addressing both the problems of less availability of financial resources and minimising the time losses in the manufacturing process (Naylor *et al.,* 1999) due to machine breakdowns which an indicator of lean manufacturing. Time taken to repair machines costs

time in manufacturing (Hopp *et al.,* 1990) and unexpected machine breakdowns are less with preventive machine maintenance as proactive action is taken to ensure a proper machine maintenance system so shorter lead times are possible. Preventive maintenance is a low cost lean manufacturing practice that is easily possible with SMEs (Lee, 2004).

Careful supplier-base selection through reliability tests, maintaining a good relationship especially with their regular suppliers and retaining more than one supplier for the same raw material are the measures have been taken to minimise the time losses due to poor supply performance. Therefore the reliable suppliers, in terms of the standards of raw materials, have contributed to achieving higher quality of products (Monczka *et al.,* 1998). Careful selection of suppliers and performance evaluation is critical for a higher quality of a product. RBV theory suggests that suppliers' trustworthiness is a socially complex capability which is very important for a firm. Especially the 'more successful' case companies work only with a set of carefully-selected suppliers and they maintain a long term relationship with them. Moreover close cooperation with suppliers or effective supplier management is a lean practice suggested by Papadopoulu and Ozbayrak (2005) that can be implemented by SMEs with a weak resource base. However, effective supplier management is only possible regarding the suppliers selected at the discretion by the case companies. Only with a few FOB orders 'more successful' companies get to select their own suppliers for fabric and/or accessories while 'less successful' can have their own choice of suppliers only for accessories (only when buyers approve to do so). In every other instance they have to deal with buyer nominated suppliers for sourcing raw materials limiting the opportunity to build up a closer cooperation with suppliers.

Back-scheduling of the manufacturing operations from the expected date of delivery of goods is a common technique of planning manufacturing operations (Bruce *et al.,* 2004). As a contingency-planning technique back-scheduling is done moving a few days back from the delivery dates so a margin for successfully handling of any uncertainty is available without delaying on time delivery. Back scheduling manufacturing process is an effective method to control in the textile and apparel industry (Bruce *et al.,* 2004) and also has paved the path to effectively deal with the uncertainty of moving forward planned delivery dates. The garments

211

are ready to be shipped in advance before the agreed delivery dates as back-scheduling is done with a margin kept for uncertainties enhancing the flexibility of manufacturing process. This results in improved supply chain performance which is especially important in textiles industry due to its volatile nature (Candace *et al.,* 2011). Actual production is not started until the order confirmation so waste from over production is eliminated evidencing lean manufacturing.

Even though the internal manufacturing operations seem to be flexible to a certain extent, implementing agile principles would be a challenge due to the companies' limited exposure to the market information, absence of proper collaborative partnerships, top-down management and lack of information management systems as the successful execution of agility depends upon organisational structures, information technology systems, logistics process and management mind-sets leading to flexibility (Christopher and Towil, 2000).

g) *Strong Mutual Understanding*

The companies from both categories carry out their business relationships mostly based on a set of mutually understood rules and procedures. A normative control system of relationship management (Weitz and Jap, 1995) with foreign direct buyers and local buying offices can be seen as they do not depend on any formal business contracts. This has resulted in saving the time taken for problem solving as less paper work is moving through the supply chain. The long term business relationships have instilled confidence and trust, especially among the companies that work directly with foreign buyers. Irrespective of the minor problems found with buying offices, as a whole the 'less successful' companies trust the buying offices' ability as a business partner. Therefore the 'less successful' companies carry forward the business relationship based on competence trust (Sako, 1992) and reliance (Jiang *et al.,* 2010) on buying offices. The 'less successful' companies expect that buying offices will fulfil their specific needs given the proven capability and exchange standards in place (Jiang *et al.,* 2010). The companies from both categories have been careful to select a set of trustworthy suppliers through reliability tests ensuring the quality of products and services offered by them remains at a higher standard (Jiang *et al.,* 2010) so the delays due to poor supply performance have been kept at a minimum. Despite these conditions, the companies

that work directly with their foreign buyers have been working with the same buyers for a longer time period and have been influenced in developing a strong mutual understanding even without proper business partnerships or collaborations. Ganesan (1994) explains that dependence has a positive effect on developing long term relationships. Having these companies to work in a market highly-dominated by foreign buyers has also impacted on building up a strong mutual understanding with direct foreign buyers.

These successful SCM practices effectively been able to reduce time wastages in the supply chain particularly time saved in directly contacting buyers, working in teams, implementing 5S, ERP, MRP, CAD and CAM are mere indicators of lean manufacturing that are leading to shorter lead times. The implementation of LM significantly reduces lead time (Lathin and Mitchell, 2001).

5.2.2   Value-addition Related Successful Strategies

Effective logistics cost management techniques, productive employees, innovations and low product development times, proper customer order path management, low range of products and high level of quality management are the successful SCM strategies found by this research in relation to the value addition context of the products. These strategies are mainly focused on minimising the cost of production and no evidence were apparent for any strategies implemented on the price of the garments as a means of value creation. These findings further support the idea of that the lack of control over the market as a result of having to operate in a buyer nominated market limit the manufacturers' negotiation power over the price of the garments.

a) Effective Logistics Cost Management Techniques

More than 80% of the raw materials are imported by both 'more' and 'less successful' case companies so logistics cost management has been difficult for these companies. The 'less successful' companies' effort is to avoid trade-offs in local transport planning as a measure of minimising logistics cost. Delivery channel and vehicle scheduling play an important role in achieving efficiency of any distribution mode (Gunasekarn *et al.,* 2001). The 'more successful' companies gave a lot of consideration to minimising shipping costs, information processing costs and new product developments and grading costs. Higher shipping cost is

one of their main problems as they carry out FOB orders which involve considerable transaction costs as explained in TCA (see Section 2.4.2). Even though import and export costs are an uncontrollable cost component in common for both categories of case companies, 'more successful' companies carrying out more FOB orders means import and export cost component is also higher than the 'less successful' companies. However, yet the higher profit margins of the 'more successful' companies have been possible, probably due to the long term strong business relationship with direct buyers.

Case Study C has been able to reduce shipping costs effectively by choosing a shipping agent who permits console boxes where it can consolidate different companies' materials so this company does not have to pay the full cost of a container when it has to ship only half a container which is the case with other two companies from 'more successful' category. Minimising the waste from transportation is one type of waste acknowledged by Toyota Production System which is an indicator of lean manufacturing. However, these companies focus only on cost reduction as a measure of improving supply chain performance which is ineffective as reducing one component of cost has an impact on another component of cost (Maskell, 1991). Therefore cost reduction has to be done carefully. And on the other hand cost should also be measured as cost, time and reliability as key performance indicators of internal supply chain performance as suggested by Banomyong and Supatn (2011). Nevertheless the chosen companies maintain a higher level of quality of garments with the minimum defective rates achieved through minimising the cost of mistakes.

b) Productive Employees

The production employees of 'more successful' companies are more productive than the employees of 'less successful' companies as more than 50% of the production staff of 'more successful' companies is able to carry out multi-functions. These companies have carried out multi-function training with several purposes: a risk minimising strategy as a solution for frequent staff fluctuations, to improve the efficiency of workers, and to avoid bottlenecks and inefficiencies in the manufacturing process thus low product development times and improved quality levels are achieved (Spann *et al.,* 1999). The productive employees minimise the mistakes so avoid the costs of non-value adding activities and multi-functioned

employees and cross functional teams can be considered as intangible value added streams that improve value added of finished garments (Rylatt, 2003). Multi-function training is a lean management practice which does not require a large resources base (Anthony and Kumar, 2005) so it can be easily implemented especially in SMEs.

The company from the 'more successful' category which offers its own brand to the UK market is satisfied with the creativity and efficiency of its R&D staff. Fuchs *et al.* (2000) stated that SMEs' competitive advantage lies in creative work force offering differentiated products for niche markets.

c) *Innovations and Low Product Development Times*

Case Study A of the 'more successful' companies manufactures its own brand with consistently changing new designs. Therefore, product flexibility (Beamon, 1990) exists with Case Study A whereas the rest of the companies only produce foreign buyers' designs. The company that offers its own brand to the UK market mainly manufactures men's shirts which constitute about 90% of their product range and also it owns a separate manufacturing plant which is focused only on local market. Therefore it already owns its brand whereas other companies do not cater to the local market so the rest of the companies are not in a position to develop their own brands. Apart from this, the nature of the market they operate in is a buyer nominated market which again restricts these companies to carry out new product developments. However external market information does not support the fact that this is a strong brand that holds a premium price.

This company, along with Case Study B from 'more successful' category, have been able to achieve low product development times compared to other companies. The majority of this company's product range in industrial uniforms. Hence it is evident that the lesser the complexity of design variations then the lower the product development times which is an indicator of a flexible supply chain (Gunasekaran *et al.,* 2004). The companies that manufacture fashion garments experience higher product development times as the designs are more complex than that of men's shirts and industrial uniforms. The lower the time cost of production adds more value to the final products and also shortens the lead time of production. Low product development times with the companies that manufacture less

complex designs and low machine set up times with all the companies prove that these companies implement Flexible Manufacturing Systems (FMS) to a certain degree. FMS is preliminary to an agile strategy (Christopher, 2000) and, agile supply chains are more effective in a volatile industry like fashion (Harrison *et al.,* 1999). Leagility can be implemented as a combination of both lean and agile supply chains. Fashion garments are less predictable and uniforms are relatively predictable in terms of designs and demand so it can be seen that Case Study A and B have a clear demarcation in their product portfolio to implement leagility as Case Study A manufacture ladies' blouses with basic designs and men's shirts and Case Study B fashion garments and industrial uniforms. However the evidence does not support that the case companies have made any effort to realise these differences in their product portfolios to modify the manufacturing technologies to achieve the best performance through supply chain innovation. Tools and techniques like agile manufacturing can largely contribute, especially at the 'crises-points' of SMEs, to companies thinking in a different way about the future and six variables of cost, delivery, quality, performance, flexibility and innovativeness are bases for the primary drivers for the business (Poolton *et al.,* 2006). However, the Sri Lankan garment industry is in danger of global competition due to its high cost of production, longer lead times and less flexibility as a consequence of the higher dependency on buying offices and lack of innovativeness so the applicability of agility principles and techniques is also remains a question.

d) *Proper Customer Order Path Management*

The 'more successful' companies are thoroughly aware of the path an order makes to specify points of non-value adding (Gunasekaran *et al.,* 2001; Gunasekaran *et al.,* 2004). The knowledge of customer order path is an intangible value added stream that can add value to the tangible products (Rylatt, 2003). Working directly with foreign buyers and the strong mutual understanding between each other have assisted in sharing this information with each other and JIT and advanced information technologies may accelerate this process. However MRP and ERP systems run in the chosen 'more successful' companies have been useful in tracking the manufacturing operations only inside the companies as they are not connected with any external party. Working in a foreign buyer-nominated market can largely be influenced on connecting their ERP and MRP systems with suppliers and buyers. However it

is suggested that the integration with external parties of suppliers and customers is a key success factor of the companies (Frohlich and Westbrook, 2001).

e) Low Range of Products

It was found that the lower the range of production then the higher the value added to the finished products. The three companies' from the 'more successful' category value addition per employee is higher than that of the companies' from 'less successful' companies and also production ranges are smaller than that of the 'less successful' companies. The companies with a lower range of products are more likely to introduce new products and perform better on value addition per employee, speed and delivery reliability than the companies with higher product ranges (Mapes *et al.,* 1997). Evidencing this, Case Study A from the 'more successful' companies category, offers its own brand to the international market with innovations and also all of the 'more successful' companies perform efficiently in improved lead times (speed) in comparison with 'less successful' companies.

Sewing staff also find it less complex and easy to manufacture a lower range of product ranges by improving the familiarity of each range to a great extent so the time taken to produce one garment is less thus improves the efficiency of workers adding more value to the products. However, the differences of product portfolio characteristics have not sufficiently been recognised by these companies to streamline upstream and downstream supply chains accordingly such as leagility (Mason-Jones *et al.,* 2000).

f) High Level of Quality Management

Regardless of the category ('more' or 'less successful') two mechanisms have been enforced to ensure the high level of the quality of the final garments in every company. Direct buyers and buying offices require trim cards (a document where the samples of all required materials are included) from these companies and when the 'more successful' companies buy fabric either from buyer nominated suppliers or suppliers at their discretion, they are required to send inspection reports obtained from a third party to guarantee that fabric is within the required standards. This process ensures that fabric and accessories used to manufacture garments are within the expected standards thus the high quality of the products is maintained (Theodorakioglou *et al.,* 2006).

The other mechanism for maintaining quality is that these companies themselves implement their own quality control systems to ensure that technical specifications for the garments sent by buyers and buying offices are accurately met while the manufacturing process is run. While a rigorous quality checking is carried out at every single point of production lines, a final quality inspection is also done before shipping the products so the defectives are maintained at a minimum of 2%. The lower defective rates eliminate waste including time through minimising mistakes and rework which is a characteristic of lean supply chain management (Naylor *et al.,* 1999). These two types of quality control measures together avoid re-working to great extent so the cost of mistakes is retained at the lowest possible level which is a step forward to add more value to the final products. This further reflects the leanness in the manufacturing operations of these companies.

5.2.3 *Direct Contacts*

Strong business network, strong business relationship management and improved profitability and business risk diversification are the successful SCM strategies achieved by 'more successful' companies as a result of having direct contacts with their foreign buyers and discussed below in relation to the academic literature. These strategies are highly inter-related but needed to be presented individually herein to give them sufficient credence. Having to work with direct buyers has immensely contributed to shorter lead times by shortening the supply chain of 'more successful' companies. And also sound business relationship makes problem solving and information sharing faster in the supply chain. Therefore, direct contacts are paramount important in achieving shorter lead times and creating value by saving the time taken to work through buying offices.

a) *Strong Business Relationship Management*

Working with direct buyers over a long time has helped the 'more successful' companies to develop a strong business relationship by which both parties have benefitted. It has been further supported to build trust and confidence among them so none of them are reluctant to make sacrifices to continue a sustainable business relationship. Therefore, the nature of the commitment lies in the relationship between each other tends to balance short term problems to preserve the business relationship (Ganesan, 1994). And also these companies maintaining

strong mutual understanding and business relationship especially with their foreign buyers, reflects the relational capital value addition context of these companies (Rylatt, 2003).

b) *Strong Business Network*

The 'more successful' companies have found that a strong business network has been possible as a result of contacting foreign buyers directly. The existing business network especially has become worth when new buyers themselves approach these companies that have helped in creating new buyers. Thus it proves the importance of social networks for internationally oriented SMEs in creating foreign markets (Ellis, 2000). It has provided a kind of assurance to 'more successful' companies enhancing the access to relevant information. An SME's business network is a valuable asset as it provides the opportunity to access relevant data so it is a kind of insurance (Spence *et al.,* 2003). These networks are particularly important for SMEs especially that are export oriented in creating a platform for linking the foreign markets (Ellis, 2000). The long term relationship with the buyers thus the strong business relationship has supported in developing a strong business network. Informal business networks play a key role, especially with SMEs, as they are unable to access professional information due to a lack of funds (Spence *et al.,* 2003).

c) *Improved Profitability and Business Risk Diversification*

Working directly with foreign buyers has improved the profitability and diversified the business risk of the companies from the 'more successful' category as a result of increased trust. Therefore highly-trusted suppliers and buyers in their supply chains are perceived as low-risk and thus increase the confidence in the business relationships (Ganesan, 1994).

Direct contact with buyers develops continuous communication and fosters a trusting relationship between manufacturers and buyers thus enable the ability to negotiate over the price so a reasonable price is ensured. This, in turn, has the effect of increasing profit margins through low transaction costs (Carney, 1998) that are born from trusting relationships. It is risky for manufacturers to depend solely on buying offices so working directly with foreign buyers enables manufactures to diversify business risk as the opportunity to work with multiple direct buyers is possible.

5.3 Barriers to Improving SCM Strategies

The constraints faced by the Sri Lankan garment industry SMEs under the key themes of lead time, value addition and business relationships to improve existing SCM strategies as evident through data analysis are discussed in this section with the support of previous literature.

The constraints illustrated in Figure 16 can be identified as controllable and uncontrollable factors as discussed in the findings chapter (Section 4.3) depending on the fact that whether they are internal or external to the case companies (micro or macro environmental). These micro and macro environmental factors are then presented in Figure 17 and discussed in this section with a background of relevant literature. Except the lack of local fabric base, foreign buyers nominated market, less control over suppliers and uncontrollable import and export charges, the rest of the constraints are controllable as they have been caused by different internal factors of the case companies. Moreover the majority of the barriers to improve SCM strategies were evident among the 'less successful' companies. The reason behind this is that the absence of direct contacts with foreign buyers makes these companies earn comparatively lower profits so the lack of funds leading to many of the constraints to be emerged.

5.3.1   Macro Environmental Factors
The following constraints are external to the case companies and uncontrollable. Even though they are identified as separate constraints, they are inter-related.

The lack of fabric base in the country essentially implies the importance of backward integration in the Sri Lankan garment industry which is weak at present (Kelegama, 2009). Thus the lack of backward integration has led to poor performance of different aspects of these companies' supply chains creating long lead times and lower value added: foreign-buyer-nominated markets, less control over suppliers, improper customer order path management, les control over external supply chains and experiencing high import and export charges. The lack of fabric base found in Sri Lanka is a common uncontrollable factor external to these companies, leading to higher import and export charges, less control over suppliers and having to operate in a foreign-buyer-nominated market. These constraints originated based upon the mere factor of the lack of fabric base found in the island avoiding shorter lead times and higher value added. Therefore if backward integration in the garment

industry can be succeeded, it will definitely be an opportunity presented by macro business environment. Moreover, since fabric should always be imported shipping charges and duties are significantly higher, especially within the 'more successful' companies. The relationship among these factors is shown in Figure 20.

Figure 20: Relationship between Macro Environmental Factors
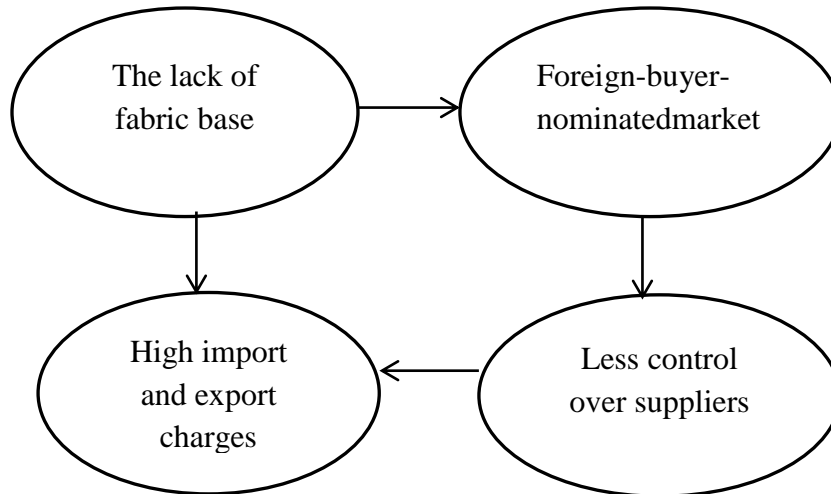
a) *The Lack of Fabric base Found in Sri Lanka*

A limited range of fabric is produced within Sri Lanka as a means of backward integration of the large players but not for the open market. The lack of backward integration (Tirimanne and Ariyawardana, 2008; Kelegama, 2009) has caused the Sri Lankan garment industry SMEs to import more than 80% of the raw materials (Saheed, 2007) from countries like China, Indonesia, Thailand and India; on average, two weeks are needed to sea-freight the goods to Sri Lanka. The 'more successful' companies have found that new market opportunities will definitely be open if lead time can further be reduced hence if required raw material can be sourced within Sri Lanka so lead time can be reduced by two weeks which can make a significant effect on lead time reduction.

b) *Limited Control over Suppliers*

The companies that work with buying offices have little control or influence on the efficiency of fabric supply. Buying offices are also not very cooperative in solving these problems as

they rarely respond to supply delays or poor supplier performance in general. The condition with the companies that directly contact their buyers is also not that different as mostly they deal with buyer nominated suppliers so the delays to the production due to poor supplier performance cannot be underestimated. Working in a foreign-buyer-nominated market accurately explains this condition. Knutsen (2003) emphasised that buyer-driven commodity chains are common in garment industries which is reflected in the case of the Sri Lankan garment industry and as a result its limited choice of suppliers.

c) *Foreign-buyer-nominated Market*

Irrespective of whether these companies directly contact their buyers or contact is made through the buying offices, business operations will be carried out in a foreign-buyer-nominated market in many aspects which results in extended down-time for decisions to be made by buyers and longer lead times. This situation is exacerbated by the companies that work with buying offices as every issue must be channelled through buying offices which takes additional time. These companies having to work in foreign-buyer-nominated markets has caused them to have limited control over the supply chain especially with the companies that work with buying offices. This has restricted flexibility in the supply chain and thereby reducing competitiveness (Bruce *et al.,* 2004). The absence of long or short term contracts between manufacturers and buyers also contributes to the case study companies to remaining under the control of foreign buyers because transfer pricing is higher when supply chain members try to maximise only their own efficiency instead of the whole business network (Cooper and Slagmulder, 2003). A supply chain that is operating towards a common goal based on collaborations and partnerships tends to make pricing decisions more efficiently. Sri Lankan garment industry SMEs do not have substantial negotiation power over setting the price of the garments; especially the companies that work with buying offices mostly have to accept the price decided by the buying offices. An agency theory view of supply chain performance is that the ultimate performance of a supply chain can be subject to the economic and market conditions, not only to the nature of agency relationship.

d) *No Control over Fuel, Import and Export Charges*

The 'more successful' companies having to import more than 80% of the raw materials has been a reason to incur a considerable amount of cost for import and export charges, shipping costs and customs duties. The constantly rising price of fuel is also uncontrollable; these costs do not contribute to the value addition of the final products. This scenario is common with the 'less successful' companies although the shipping cost is absorbed by the buyers. Kelegama and Epaarachchi (2001) suggest that over-dependency on raw materials from abroad lowers the value addition of Sri Lankan garments however findings of this research suggest that it is not the sole factor. The external factors of uncontrollable export, import duties and constantly rising fuel costs have been other main constraints that lower value addition of production. Furthermore, the negligence of the development of nation's SME's by policy makers of Sri Lanka is also a common failure factor of Sri Lankan SMEs (Gamage, 2003). Higher costs of production limit the competitiveness of the Sri Lankan garment industry in the global market. Bessant and Tidd (2007) advocate that developing countries' manufacturing SMEs are vulnerable in the face of low cost products presented from the countries like China and India.

5.3.2 *Micro Environmental Factors*

Most of the identified constraints: lead time, value added and direct contacts related are internal to the case companies. It was possible to group them in to the four broader categories of resistance to accept business risk, the lack of business vision/strategic business thinking, the lack of resources and low profit margined niches. Further, these four broader categories are the root causes for identified constraints to occur. These categories of internal barriers are illustrated in the Figure 17 of findings chapter and discussed below together with each sub theme falls under the main categories with the light of previous literature.

a) *The Lack of Resources*

As shown in the Figure 21, the inability to implement advanced information management and scheduling techniques, relatively lengthy supply chains and limited machine and staff capacity and inadequate customer order path management are the appeared constraints due to the lack of funds. Inability to implement advanced information management and scheduling
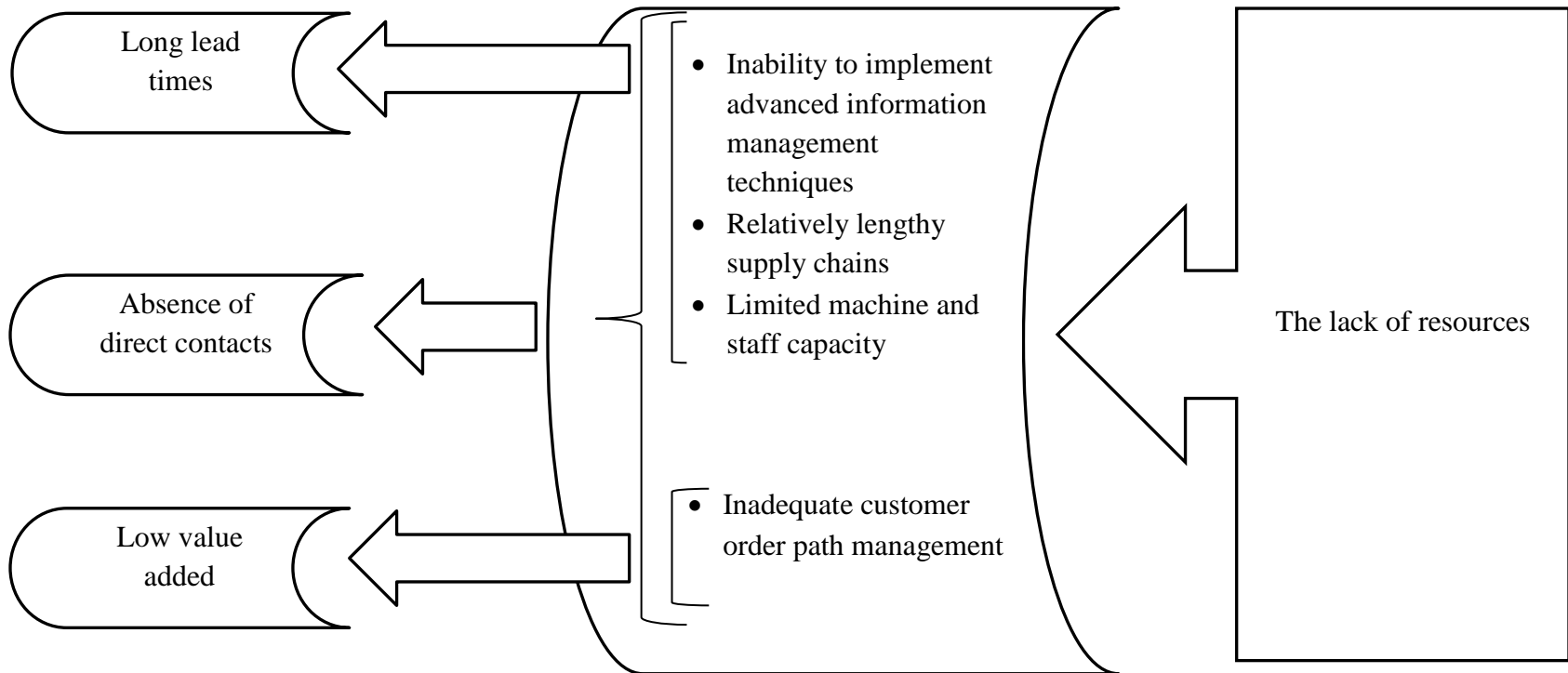
223

techniques, relatively lengthy supply chains and limited machine and staff capacity are leading to long lead times and inadequate customer order path management is low value added. These strategies are more indicated within the 'less successful' companies and a common problem was that low returns failed for these companies to generate sufficient resources to invest in lead time saving and high value added strategies restricting the ability to contact the buyers directly.

The lack of resources of limited machines, staff and funds is a common problem among SMEs and 'less successful' companies considered for this research own fewer resources than 'more successful' companies. Furthermore, the 'less successful' companies experience a tight cash flow so working with direct buyers has not been possible for these companies. To work with direct buyers resources such as higher standards of compliances, skilled marketing personnel and a sound financial background to purchase raw materials for FOB orders are required and this has been impossible to achieve for the 'less successful' companies. Accounts receivable, plant, property and equipment and inventories are the assets associated with a supply chain and due to the increasing inflation and decreased liquidity firms should improve the productivity of capital (Gunasekaran, 2004). Stewart *et al.* (1995) stated that total cash flow time is a measure of productivity of capital (i.e. the number of days needed to turn cash invested in assets into cash collected from a customer). Total cash flow time of the "more" and 'less successful' companies is more than a month on average which contributes to low supply chain asset productivity. Further, lower productivity of supply chain assets has caused these companies to face cash flow problems by which companies that work with buying offices prevent working with direct buyers. In order to achieve a higher value addition of products, balance between cost and the level of service provided through the final product is necessary and therefore activities such as duplicate inventories, double and triple handling of products and unconsolidated shipments that add extra cost should be eliminated (Brewer and Speh, 2000).

The Resource Based View of the firm (discussed in Section 2.2.2) suggests that firms can achieve competitive advantage through resources and capabilities. Eventhough acquiring or building tangible resources are difficult for SMEs, intangible resources and capabilities can

play a key role in creating competitive advantage (Feingenbaum and Karnani, 1991). However, it does not appear that the 'less successful' companies take the advantage of intangible assets and capabilities as lack of team work orientation and insufficient employee training are the results of ineffective resource management. The theory of SNT implies the importance of networks especially for SMEs to overcome resource barriers as they can access resources through networking. The dyad relationship with buying offices has created the opportunity for the 'less successful' companies to access buying offices' resources enabling these companies to carry out business operations.

Figure 21: The Lack of Resources

Long lead times

Absence of direct contacts

Low value added

- Inability to implement advanced information management techniques
- Relatively lengthy supply chains
- Limited machine and staff capacity

- Inadequate customer order path management

The lack of resources

None of the 'less successful' companies implement either the advanced information management techniques of ERP, RFID, CAD, CAM and MRP which negatively effect on flexibility (Beamon, 1999) or effective scheduling techniques of JIT and 5S. Flexibility is an important feature of QR implementation (Perry and Sohal, 2000) which improves lead times (Lowson *et al.,* 1999) and therefore the absence of CAM, CAD, MRP and ERP systems explains the longer lead times among these companies. The lack of understanding of an MRP system to achieve the objectives of purchasing leads to poor performance of purchasing and thus lower productivity and quality (Perkins and Gunasekaran, 1998).

The low efficiency rates experienced especially by 'less successful' companies are not surprising as the problems of speed of manufacturing operations, neatness and accuracy can be influenced when they are carried out manually. Both the 'more successful' and 'less successful' are flexible with internal manufacturing process but none of them are linked with their suppliers or buyers that make operations tracking risky and time consuming (Bruce *et al.,* 2004) which leads to long lead times. Galaskiewicz (2011) suggests the relevance of SNT theory to organisations as it provides an opportunity to share information and coordinate schedules.

Emails are the main mode of communication with suppliers and buyers and manual methods are also still used such as business letters, memos, invoices and purchase orders among chosen companies and if these companies are able to eliminate paper work in business communication then lead time will be reduced (Treville *et al.,* 2004). Even though the Sri Lankan SMEs are aware of the benefits that ICT adaption can bring about they are slow to be adopted due to many external and internal constraints that are common among developing countries (Kapurubandara and Lawson, 2007).

The lack of skilled workers and cost of funds are the main reasons for the absence of information management techniques. The companies that work with buying offices do not earn higher profit margins as they have limited bargaining power over prices. The companies with foreign-buyers contacts earn higher profit margins than that of 'less successful'

companies but still the small quantity orders have been a reason for higher cost of production so low profit margin niches are the markets they have been catering for.

ii.   *Relatively Lengthy Supply Chains*

The supply chains of the 'less successful' companies are lengthier than the 'more successful' companies' as an intermediary exists between the 'less successful' companies and foreign buyers. This has made decision making process extensively long as every communication forward and backward through the supply chain must be channelled through the buying offices. Even a slight modification of a garment is not permitted without the buyers' permission. The lack of resources made these companies work with buying offices as buying offices' resources play a significant supportive role in approaching foreign buyers. Popp (2000) discusses the dominating figure of intermediaries in textile and clothing supply chains which is often an import and export agency; this ideally reflects the case in the Sri Lankan garment industry since buying offices play a substantial role as intermediary between buyers and local manufacturers. Tirimanne and Ariyawardana (2008) and Kelegama (2009) also discuss the problems of high lead time and limited direct contacts with leading global buyers that Sri Lankan garment industry is found. They further emphasises the importance of the buying offices' role as an intermediary between foreign buyers and local manufacturers, however it was unanticipated the downside of this condition; opportunistic behaviour of buying offices, lack of information sharing and poor business relationship they maintain with manufacturers that resulting in longer lead times. Besides the resistance to business risk has prevented the 'less successful' companies initiating direct contacts with foreign buyers. On the whole the importance of the role played by the buying offices cannot be underestimated since they provide the opportunity to be linked with foreign buyers for the SMEs that are not able to contact them directly.

iii.   *Limited Machine and Staff Capacity*

A common factor limiting the success of the case study companies is the lack of automotive power and access to a skilled work force – both factors are attributed to a lack of funds in SMEs and SMEs in Sri Lanka (Gamage, 2003). The 'less successful' companies experience this problem as they have lower profits and experience higher costs as a consequence of

working with an intermediary. Furthermore, these companies are not in a position to implement ERP, MRP, CAD, CAM, JIT and 5S that have led them in ending up with long lead times. The 'more successful' companies earn higher profits than 'less successful' companies but being SMEs they still suffer due to lack of funds and skilled work staff. Intangible resources and capabilities tend to play a key role in creating competitive advantage (Feingenbaum and Karnani, 1991) as tangible resources are limited with SMEs. However acquisition of a trained work force is impossible as a way of creating intangible assets due to the frequent labour turnover currently experienced by these companies.

iv. *Inadequate Customer order Path Management*

The 'less successful' companies have limited control over their supply chains as buying offices play the major decision making role and therefore these companies are not aware of any issues beyond their immediate internal environment. Therefore nothing much can be done in order to eliminate non-value adding activities in the customer order path due to the limited understanding of the supply chain - especially the channels an order receives and passes back to the buyers. Less information is available for these companies from the buying offices and the opportunistic behaviour of the buying offices has distracted these companies from pursuing the high value added via having a complete understanding of customer order path (Gunasekaran *et al.,* 2004). The lack of resources has made these companies depend on buying offices' resources leading to lose the knowledge of customer order path which is an intangible value added stream to the tangible products (Rylatt, 2003). Thus it is clear from the evidence that asset specificity and opportunism of buying offices (as discussed in TCA: Section 2.4.2) have largely influenced these companies level of success.

b) *The Lack of Business Vision/Strategic Business Thinking*

A successful SCM implementation requires a greater coordination of business processes and activities (Cooper and Ellram,1992) that needs aligning strategy and operational practice along with the specific properties of supply chain a company is positioned with (Cox, 1999). Therefore it is obvious that the success of a supply chain lies on top manager's skills on coordination of SCM with the rest of corporate business strategies. Thus the lack of strategic business thinking of the management has largely been a reason for these companies to hinder

229

implementing effective SCM strategies. This has further affected in underutilisation of existing resources leading to long lead times, low value added and working through buying offices. The supply function is well supported with corporate strategy ensures the capabilities resulting in improved performance in the areas of cost, quality, dependability and performance (Mol, 2003).However this situation is more obvious among the 'less successful' companies. Figure 22 shows the constraints that have been arisen as consequences of the lack of business vision/strategic business thinking of the owners/managers and how each of them has avoided achieving shorter lead times, high value added and initiating direct contacts with foreign buyers. 'Relatively lengthy supply chains' was discussed under the previous category of the lack of resources and the rest of these constraints are therefore discussed in detail with regard to the reviewed literature. Sri Lankan SME sector anyway lack capital and management skills and updated or appropriate technology (Gamage, 2003). However more than the lack of tangible resources of capital and updated technology, the mere factor of the lack of strategic business thinking/business vision of the owners/managers (management skills) leaves these companies' internal supply chains less efficient and effective leading to underutilisation of existing tangible resources too.

Figure 22: The Lack of Business Vision

- Inability to implement scheduling techniques
- Frequent staff fluctuations and lack of teamwork orientation
- The absence of long or short term contracts with suppliers and buyers
- Relatively lengthy supply chains
- Top-down management

Long lead times

- High range of products
- Insufficient employee training
- Lack of innovations and high product development times
- Less effective in managing logistics cost

Low value added

- Poor business relationship management with buying offices

Absence of direct contacts

The lack of business vision

i.   Inability to Implement Scheduling Techniques

It can be seen that management has not paid substantial consideration to implementing 5S which is a low-cost, lean management practice made possible by small financial investment and employee commitment (Lee, 2004). Furthermore, it is also not properly implemented by 'more successful' companies except Case Study A. It is unlikely that the lack of funds is the reason for these two 'more successful' companies not to implement 5S as they successfully implement ERP and MRP despite the need for increased cost of funds. Therefore the lack of understanding of the significance of the implementation of 5S is a possible explanation for this. JIT is also a measure of flexibility (Gunasekaran *et al.,* 2004; Perry and Sohal, 2000) and it is not fully implemented by any of the companies. These companies fear that the implementation of JIT requires additional investments in labour, capital and equipment whereas the actual requirement is a change in the management of various production operations together with employee and management commitment; eventual implementation of JIT brings the benefits of lead time reduction, improved quality and smaller inventories (Gunasekaran and Lyu, 1997). Thus time is wasted in handling information and scheduling manufacturing operations manually.

ii.   Frequent Staff Fluctuations and Lack of Team Work Orientation

Low efficiency rates are common among the 'less successful' companies due to higher absenteeism and labour turnover rates. Staff fluctuations with frequent absenteeism and labour turnover have caused interruptions in the manufacturing schedules which lead to delays of production. These companies have been unable to realise the importance of training their employees on multi-functions so the problem becomes worse when an especially skilled worker, such as a person with pocket-attaching skills, leaves the organisation. Although cross-functional teams are an important facilitator of reduced order lead times (Gunasekaran *et al.,* 2004) target completion is rather individualistic and not team-oriented in two companies from the 'less successful' category which sounds less effective. Further, the lack of team work orientation can be seen as a result of less effort in building capabilities with proper management of existing resources. Tirimanne and Ariyawardana (2008) and Kelegama (2009) also stressed that Sri Lankan garment industry experience low labour productivity, high hourly wage rates and high manufacturing costs.

232

iii. Top-Down Management

The manufacturing decisions are not made collectively and every decision, even minor problems, are delayed senior managers can be consulted thus leading to delays in the manufacturing process among the both 'more' and 'less successful' companies. Supporting this, Karlsson and Ahlstrom (1997) suggest that generally in SMEs procurement problems are solved by the top of the organisation. While SMEs need a properly integrated decision making system in terms of a coordinated strategic supply chain positioning to stay competitive in the global market (Lim *et al.,* 2006), it is evident from the data among the chosen case studies that owners/managers have been unable to establish internal decision making systems to optimise the efficiency of internal supply chain.

Rose *et al.* (2011) suggested that quality circles can easily be implemented by SMEs; they have the added benefit of improving staff involvement in decision making. Despite this, the 'quality circle' strategy is not prominent in the Sri Lankan garment industry SMEs and every decision and communications flows top to bottom of the organisational hierarchy which has hindered to employee participation in decision making. Tirimanne and Ariyawardana (2008) found that the purchasing performance of Sri Lankan garment manufacturing SMEs that are located in the west of the country is lower compared to large scale garment manufacturing firms because organisational design features such as team involvement, integration within organisation and structure of the purchasing department have not been fully adopted. Further employee empowerment is not properly practiced even in the large firms of Sri Lankan garment industry, leading failing to involve lower level employees in decision making (Kapuge and Smith, 2007). However organisation culture is a socially complex capability which is vital for the success of a firm as proposed in RBV theory and creating it also costly for a firm.

iv. The Absence of Long Term Contracts with Suppliers and Buyers

Long term collaborations either with suppliers or buyers are not available and invoices, order confirmations and purchase orders reflect the formality of the business activities to a certain extent that have led in building up contractual trust (Sako, 1992) because a business relationship that is totally depended on trust is vulnerable (Williamson, 1985). From a view

point of SNT, the strategies of 'amalgamation' and 'decoupling' improve trust in small networks such as supply chains (Galaskiewicz, 2011) that will ensure cohesion among the firms in supply chains (Molm *et al.,* 2007).

The absence of long term contracts leaves behind these companies from achieving improved supply chain performance. However as suggested by agency theory formal contracts alone is insufficient to eliminate opportunistic behaviour and mistrust in relationships (Norrman, 2008). Further, theory of RBV implied that an SME creating collaborations with its suppliers and customers can be a solution for the problem of lack of resources and leveraging risk. Information sharing in the supply chains of these companies not a common feature and absence of collaborative business relationships can be a probable reason for this. A further improved business relationship based on long term business collaborations would have led to fast problem solving and with access to mutually shared information. The lack of a formal strategic planning process (Wheelen and Hunger, 1999) and the lack of management experience (Brudal and Preisendorfoer, 2000) explains this situation because proper cost management and information management techniques and long term business vision and planning are not realised among many of the case study companies especially the 'less successful' category.

The only form of formal contracts observed in this research was in 'more successful' companies which sub-contract orders for apparel giants in the country; this is a way of accessing external resources that can reduce the inherent weaknesses of a small-scale operation (Pil and Holweg, 2003). However none of the evidence supports the notion that these companies can access large scale companies' resources as they have to go through a thorough compliance audit to be selected for sub-contract orders. The absence of supply chain partnerships have made them to work with different buyers and suppliers on some occasions which prevents them building up a long term business relationship with the same business partners. Contract management with China's apparel industry supply chains is one of the successful risk management strategies and is used among the supply chain members as a means of building trust and improving flexibility (Kam *et al.,* 2011). Even though having to work in a foreign-buyer-nominated market limit the opportunity for these companies to

work on long term collaborations with foreign buyers, the research evidence do not support the fact that they have made any effort to initiate long term collaborations with their foreign buyers or suppliers. Bruce *et al.* (2004) however questioned this view due to the fact that the textile and clothing supply chains are often dominated by a large, powerful high street retailer at the end of the chains as the back of the supply chains, which is the manufacturing sector, consists of small scale companies with limited power (Towers, 2000). The value of partnerships is therefore doubtful especially in terms of the benefits for the back end of the supply chains as powerful retailers can influence on price (Bharma *et al.,* 1998). The Sri Lankan garment industry ideally exemplifies this imbalance of power as it is at the vulnerable end of long supply chains that are dominated by large scale multinational fashion retailers so have a limited amount of negotiation power over the prices.

v. *Less Effective in Managing Logistics Cost*

The awareness of logistics cost components is vague among the managers/owners of these companies. The proper cost control mechanisms are not measured accurately and therefore have been less effective in assessing the financial performance of their supply chains (Gunasekaran *et al.,* 2001). In all the case study companies, on average raw materials and work in progress stocks are in the warehouses for one to two months and fabric stocks stay even longer than this (up to about three months within the 'less successful' companies) as buying offices send them very early before production commences. This evidence leads to the suggestion that inventory costs should be higher among these companies and the absence of complete understanding of the proportionate of logistics costs leave them in vulnerable with higher costs of production while less value is added. Harrington (1996) identified inventory as the biggest hidden cost in the organisations thus understanding cost associated with inventories is important. The lack of control over suppliers and having to import the majority of raw materials are also the reasons contributing to higher inventories of case companies of this research. Levy (1997) mentioned that too low or high inventories are possible as a means of minimising the risk of volatility nature of inventories when they should be transported between longer distances which can create longer lead times. Sea freight is the most common mode of transportation and China, Indonesia, Thailand and India are the sources of most raw materials. Therefore, having raw materials transported over

longer distances creates a risk of unavailability of raw materials before production commences so as a solution these companies tend to place orders well in advance of manufacturing. There is clearly a trade-off between shipping costs and inventory costs (Gunasekaran *et al.,* 2001) so these companies should make every possible effort to accurately balance high shipping costs with the costs of keeping idle inventory. Information sharing between buyers and suppliers with the chosen companies is uni-directional and linear and the use of information technology to be linked with external parties of buyers and suppliers is also not available which again leads these companies to have higher inventories (Hewitt, 1999).

The lack of knowledge about customer order paths, especially with the companies that work with buying offices, inhibits understanding non-value adding activities in the supply chain so the cost of production remains high. The 'more successful' companies also struggle to decrease the cost of production; small quantity orders have been one of the main reasons for rising shipping costs as they have not been able to consolidate shipments (with the exception of Case Study C).

vi.   Lack of Innovations and High Product Development Times

Innovations have not been possible as these companies do not have control over the market. It is a buyers' market and these companies manufacture specific designs. Although one company from 'more successful' category offer its own brand to the UK market, evidence are such that it is not well positioned and does not enjoy positive brand equity in the market. None of the other companies are involved in new product developments as the nature of the market does not permit this type of innovation. High product development times are common with the 'less successful' companies as the workers are less productive and product range is higher so the value addition to the final products remains low. Kumar and Subrahmanya (2010) acknowledge the factors that inhibit innovations in SMEs: lack of skilled work force and technical know-how, market uncertainty and financial risk of investing in innovations. However among the chosen case study companies the nature of the supply chain relationship has been the main reason for the lack of innovations as they have to operate in a buyer nominated market which means manufacturing to the buyers' strict specifications. This has

further led to a poor business network and an implication of social network theory for this is that a network is a source of tacit knowledge which improves innovation (Cooke and Wills, 1999).

vii.   High Range of Products

A greater range of products, with lower value addition, is manufactured by 'less successful' companies compared with the 'more successful' companies as these companies have been unable to recognise the impact of an effective product range on employee productivity. Mapes *et al.* (1997) suggest that greater the product range lower the value addition corroborating the findings of this research. Furthermore, the 'less successful' companies' product range consists of fashion garments which involve more complex designs than industrial uniforms with Case Study B and men's shirts with Case Study A that have been caused to high product development times.

viii.   Insufficient Employee Training

Two companies from 'less successful' category are not satisfied with the productivity of production workers however this is not a factor for development as multi-functional training is not considered to yield a margin benefit. The lack of funds, organisational culture and strict deadlines are the reasons for not carrying out proper training for the employees. The absence of training the production workers on multi-functional training has resulted in interruptions to the manufacturing process when the employees with special skills leave the jobs. The lack of business vision of managers/owners has inhibited thinking of appropriate strategies to retain the workers who can perform special functions because human resources play an important role in improving the effectiveness of resources in an SME (Chandler and Hanks, 1994). The maximised utilisation of existing resources is important, especially for SMEs, as they run the business with a limited amount of resources.

ix.   Poor Business Relationship Management with Buying Offices

Even though the case study companies trust the buying offices as business partners there is not a smooth business relationship between buying offices and the 'less successful' companies. The lack of required information sharing is the reason behind the misunderstanding of each other. Social network theory discusses the importance of networks

from the aspect of information sharing. However getting trust is one of the key issues to form an effective network resulting in poor 'know-how' transfers among the actors in a network (Powell, 1990). The informal business contacts of these companies with other companies have further proven that buying offices cannot always be trusted hence the 'less successful' companies have been discouraged to work with direct buyers as they believe the situation with direct buyers will deteriorate further. The lack of trust between the buying offices and these companies has also been a reason to have poor business relationship between them and trust is essential in long-term relationships (Ganesan, 1994).

The members in a supply chain act as both agents and principles depending on the number of tiers in a supply chain thus multiple dyadic relationships can be seen. The concepts of agency theory which are information asymmetry and environmental uncertainty (discussed in Section 2.4.2) are the common problems in an agent and principal relationship. The greater the number of tiers in a supply chain and longer the supply chain, the worse the problems of information asymmetry and environmental uncertainty. In contrast based on the implications of the social network theory to SCM; SCM is a small-world of network and networks are very important to maintain sound business relationships (Watts, 1999). However the companies that work with buying offices are not provided with important relevant information which leads these companies to perceive working with direct buyers is high-risk. The lack of capable staff, funds, business network and machinery have made them highly depending on buying offices' resources and therefore terminating the business relationship is costly. Therefore higher asset specificity (as discussed in TCA Section 2.2.2) has caused these companies to work with buying offices' regardless of their opportunistic behaviour. Moreover, when the goals of principal and agent are different, the utility maximising behaviour of principal and agent leads to the opportunism in the relationship (Fama, 1980). Buying offices are intermediaries to various garment manufacturing firms and manufacturing firms on the other hand solely depend on buying offices to receive orders thus they are functioned in different business models. Even though the role of incentives and goals in an agency relationship creates problems, information asymmetry, adverse selection and moral hazards (explained in Section 2.2.2) are also the factors that create agency problems (McMahon, 2004) leading supply chain members to over or under perform (Hornibrrok,

2007); these result in conflicts between owner/manager and outside parties for SMEs (Easterwood and Singer, 1991) as exemplified in the poor business relationship between the 'less successful' companies and buying offices.

Opportunism of buying offices as suggested in TCA has made the situation worse for these companies and they are not pleased with the behaviour of buying offices. Opportunistic parties in a supply network tend to break promises for their own benefit (Barney and Ouchi, 1986). Buying offices share a limited amount of information with these companies which causes them to have higher transaction prices because, to some extent, uncertainty is linked to the transactions (Barney and Ouchi, 1986). Opportunistic behaviour of supply chain partners negatively affects the intention to continue the relationship as a result of decreased trust (Jena *et al.,* 2011). However due to a lack of resources, SMEs have to depend largely on intermediaries which leads to information asymmetry (Zacharakis, 1997) and opportunistic behaviour of the intermediaries (Nooteboom, 1993). Despite the fact that all these factors have created conflicts in the agency relationship, the competition for business means that relationships are pursued despite these difficulties. Moreover, a social network theory perspective of the same condition is such that SMEs can access external resources as a solution for the lack of resources which is an inherent weakness (Havnes and Senneseth (2001). Further to this, mutual assistance in problem solving was not observed in the business relation between buying offices and 'less successful' companies thus reduces efficiency and speed in a supply chain. Improved information sharing (Toni *et al.,* 1994) and mutual assistance in problem solving (Maloni and Benton, 1997) are realistic outcomes of supply chain partnerships.

In spite of these conditions, 'less successful' companies not having made any effort to work with direct buyers means the poor strategic business thinking and the lack business vision of owners/managers.

c) *Low Profit Margined Niches*

These companies targeting niche market means that they are trapped in manufacturing small quantities which prevent these companies reaching the benefits of mass scale production. This has further made them ended up with the high cost of manufacturing. Figure 23
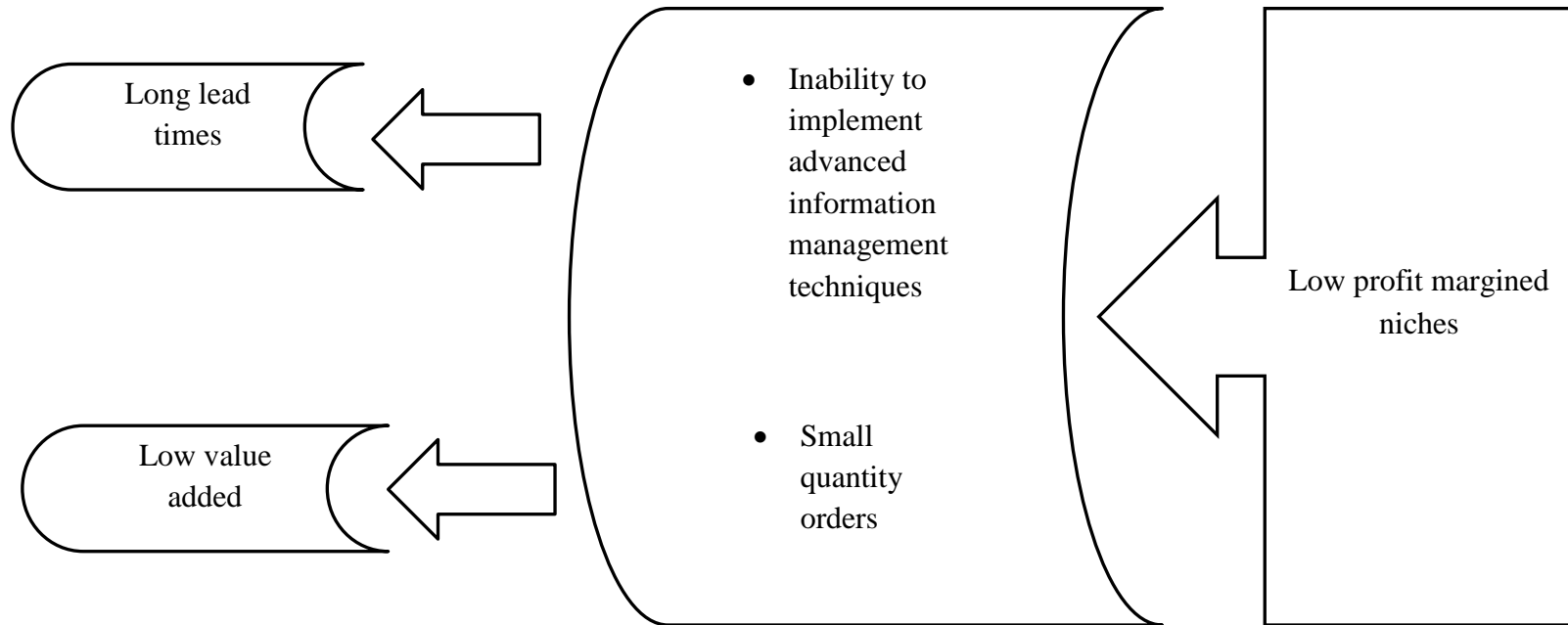
demonstrates the constraints emerged as a result of targeting the low profit margined niches which are small quantity orders and the lack of implementation of advanced information management techniques leading respectively to low value added and long lead times. Inability to implement advanced management techniques was discussed in relation to the past literature under the constraint category of the lack of resources and therefore remaining constraint of small quantity orders is discussed below in detail with related literature.

The low returns made from low profit margined niches has led to lack of resources making impossible these companies to invest in advanced information technologies so they are running behind with longer lead times. However, the 'less successful' companies are anyway meant to accept buying offices' orders thus it is beyond their control. The 'more successful' companies also have unable to receive sufficient order quantities to reach the benefit of utilisation of optimum manufacturing capacity.

i.   *Small Quantity Orders*

Achieving supply chain efficiencies has been difficult due to the higher costs associated with small quantity orders. This has been an issue especially with the 'more successful' companies as they have to import raw materials also in small quantities at their costs in relation to FOB orders. Small quantity orders when received with greater range of design variations the cost of production rises further more as design variations also makes the workers less efficient. Even though the 'more successful' companies have realised the higher cost of manufacturing of small quantities, dependence on foreign buyers to receive orders and limited manufacturing capacity have prevented them achieving economies of scale through large scale manufacturing. This finding is in agreement with Vaart and Donk's, (2006) findings which showed that SMEs are unable to capture the markets that need bulk production quantities, consistent standards and regular suppliers. SMEs targeting niche markets have been able to successfully survive in the turbulent demand conditions (Storey, 1993). However the niche markets targeted by these companies are less profitable that have been neglected by large buyers. This situation is again a consequence of being players in the markets dominated by foreign buyers to a great extent.

Figure 23: Low Profit Niches

Long lead
times

Low value
added

- Inability to
  implement
  advanced
  information
  management
  techniques

- Small
  quantity
  orders

Low profit margined
niches

d)   *Resistance to Accept Business Risk*

Being the 'less successful' companies not ready to accept business risk has made them work through buying offices leaving them with low returns. Figure 24 shows the constraints caused by the broad factor of resistance to business risk: relatively lengthy supply chains and less effort made to reach direct buyers. The constraint of relatively lengthy supply chains was considered under the broad factor of the lack of resources and therefore 'less effort made to reach direct buyers' is comprehensively discussed below. Being resistance to business risk has continued the 'less successful' companies to work with buying offices making the supply chain lengthier in spite of the poor business relationship maintained with them.

The buying offices also provide the companies to work on NFE and FOB orders but none of the chosen companies from the 'less successful' category carry out FOB orders as a lesser business risk is associated with NFE orders than FOB's.

They choose to avoid the risk of business (Cousins *et al.,* 2008) rather accept it so working with direct buyers never has been possible. In contrast Acs *et al.* (1997) argue that the flexible organisational culture of SMEs leads to low risk aversion which is not the case with these companies as are not willing to accept the risk of working with direct buyers. This has resulted in these companies operating on low margined profits and long term growth cannot be expected without undertaking risky ventures (McGrath, 2001) with properly integrated business goals thus the ambition of business growth is far beyond from them. Networking reduces business risk through providing these companies with the opportunity to access more market information. However the owners/mangers' reactive and fire-fighting mentality has prevented these companies attending the business summits and meetings organised by SLCGE and EDB.

Small firms face a higher level of risk (Petti and Singer, 1985) therefore the effect of agency theory in reducing the risk with small firms is significant (Hand *et al.,* 1982). However, the benefits of a proper agency relationship is doubtful due to the poor business relationship between 'less successful' companies and buying offices. The application of code of conduct is a possible way of reducing agency problems (Roberts, 2003) but this is also restricted by the lack of funds available with SMEs (Welford and Frost, 2006). The application of agency
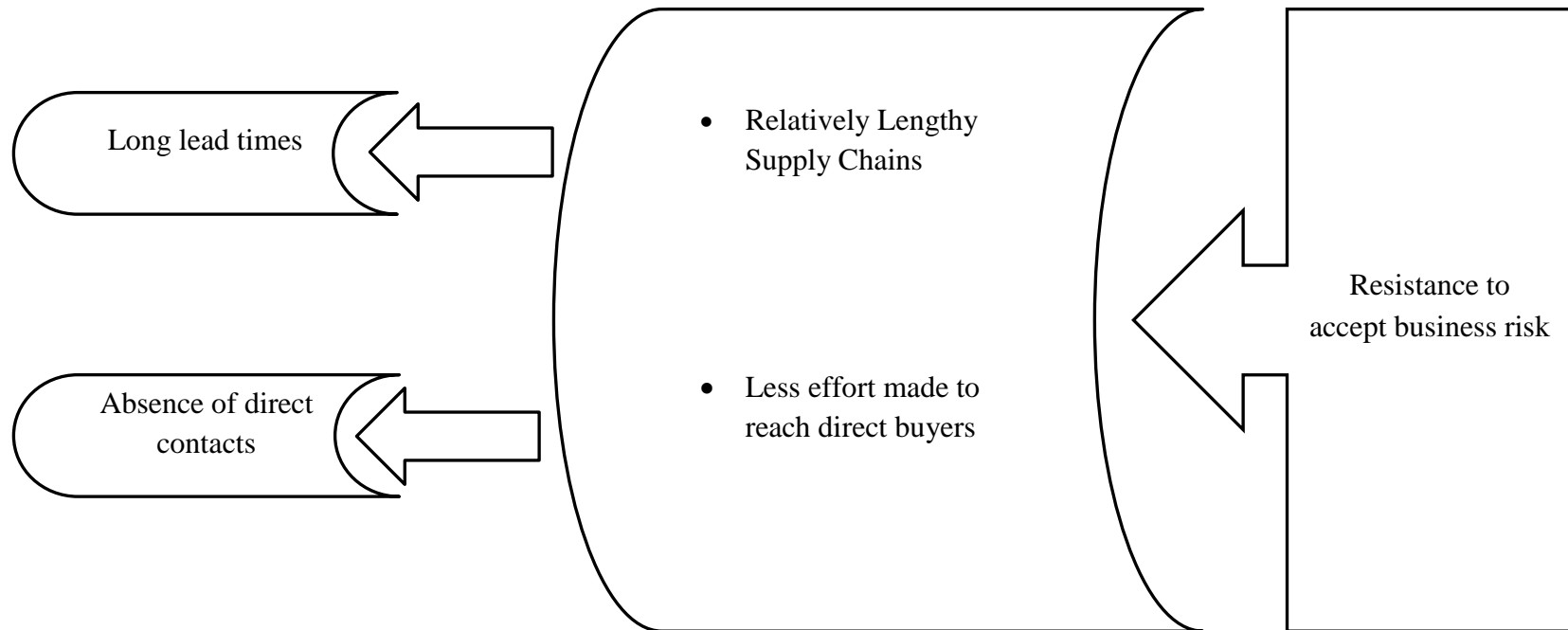
theory is anyway limited in SMEs as owner- manager agency relationship cannot be seen in the SMEs because owner and manager is one person (Ang, 1991) as validated by the case scenarios of the 'less successful' companies of this research.

i.   *Less Effort Made to Reach Direct Buyers*

The theory of SNT stresses the importance of the dyad relationship with supplier and buyer in a network which is the supply chain as these two dyads link two broad networks. Therefore maintaining a sound business relationship between suppliers (case companies) and buyers are utmost important. Nevertheless, the companies from the 'less successful' category have not made any effort to reach foreign direct buyers due to the early assumption that meeting the buyers' requirements would be impossible for them. Further the lack of timely business information with the companies that work with buying offices leads to hold a strong perception of that working with direct buyers is high risked. The cooperation between different institutions gives access to relevant information (Spence *et al.,* 2003) and these companies do not make any effort to be presented at the various summits organised by EDB (Export Development Board) and SLCGE (Sri Lanka Chamber of Garment Exporters) that create a platform to meet direct buyers and exchange market information.

Proving the 'less successful' companies longer times and higher value added contexts, when all of these constraints (lead time, value addition and direct contacts) are viewed in a lean management perspective, there are many evidences of time wastages: time wasted in shipping, liaising with buying offices, machinery breakdowns, centralised decision making, employing inefficient staff, not training employees in multi functions and not implementing information management techniques. However, the successful implementation of LM is required leadership and management, finance, skills and expertise and sound organisational culture (Achanga *et al.,* 2006) which are unavailable in these companies.

Figure 24: Resistance to Accept Business Risk

Long lead times

Absence of direct contacts

- Relatively Lengthy Supply Chains

- Less effort made to reach direct buyers

Resistance to accept business risk

5.4 Summary

In terms of the supply chain management, the 'more successful' companies considered for this research have achieved more than the 'less successful' mainly due to having direct contacts with foreign buyers and being able to develop a strong business network locally and internationally. However, irrespective of which type of an SME it is, all the companies experience internal and external barriers to implement effective SCM strategies. Some of the lean practices such as 5S, total preventive maintenance and team work are prominent to a great extent and there is much evidence for attempting to minimise resource waste as well: liaising with buying offices, training employees on multi functions and managing suppliers. Conversely, most of the lean practices (5S, quality circles) recommended in the literature especially for SMEs (Rose *et al.,* 2011) that require a fewer resources are not implemented by Sri Lankan garment industry SMEs and lack of understanding about them and traditional management practices are the reasons behind this. Even though the internal manufacturing operations are seemed to be flexible to a certain extent, implementing agility principles would be a challenge with the less exposure to the market information and absence of proper collaborative partnerships.

The impact of buying offices' intermediating on these companies has made these companies highly reliant on buying offices to make supply chain decisions; and this aspect is under estimated in present SCM related literature of manufacturing SMEs (Sartor *et al.,* 2014). This work therefore contributes to the existing knowledge of international buying offices from a supply chain perspective by providing new knowledge of how back end SMEs of lengthy supply chains are vulnerable to the high level of intermediation of foreign buyers' local buying offices.

Chapter 6 will mainly discuss the practical and academic implications of the research findings together with limitations of this research and suggestions for future research.

Chapter 6. Conclusions

6.1 Introduction

This research seeks to understand the successful SCM practices that have been implemented by the Sri Lankan garment manufacturing and exporting industry SMEs, as well as the barriers they face to achieving success. To achieve the purpose of the research a qualitative case study approach was employed and six garment manufacturing and exporting SMEs, together with two buying offices, were selected to participate in the research. In-depth interviews with relevant personnel were conducted and documentary evidence also was collected.

The research expands the current body of knowledge of the Sri Lankan garment industry with its findings. Previous studies that have been carried out have only focused on the vulnerability factors for the Sri Lankan garment industry. They have neither studied the successful SCM practices that have been implemented by the Sri Lankan garment industry SMEs, nor have they sought to understand the reasons for the industry's vulnerability. The identification of these companies' competencies in terms of implementation of SCM strategies provides the opportunity for the industry to pay the attention to development strategies. Further, unveiling the constraints that these companies face in improving SCM practices encourages the responsible bodies to rethink current policy decisions made for SME development. The fact that most of the SMEs are working with buying offices to contact foreign buyers has been discussed in the literature on Sri Lankan garment manufacturing and exporting industry is one of the main problems that the industry is facing at present. However in contrast, having studied the reasons for these companies to work with buying offices has been able to reveal the factors behind this condition. Thus it discovers the importance of the role played by the buying offices providing an opportunity for the companies that lack resources to approach the foreign buyers directly. This is entirely a different perspective of the same condition.

This chapter concludes the thesis, presenting implications according to the research objectives. It also presents the implications for the industry and academic body of knowledge, suggestions for further research and limitations of the research. The first section of this chapter will summarise the main results of the research fulfilling the aims

and objectives as stated in the introduction chapter. The next section will focus on implications for the Sri Lankan garment industry and academic body of knowledge and finally the suggestions for further research and limitations will be discussed.

6.2 Overall Findings

The original findings of this research are relevant not only to the Sri Lankan case but also other emerging economies where lead time reduction, lower value addition and having to liaise with foreign buyers through agents are major SCM challenges. While some strategies such as CAD and 5S have long been advocated within a 'Western' context, there is little attention to their effective implementation in emerging economies. Identifying successful SCM strategies and barriers to improve them provides the opportunity for companies to replicate and expand upon areas of existing success and concentrate on areas for improvement. A review of overall research findings will be provided following the order of research objectives (As presented in Section 1.6, there were five research objectives and the first objective was achieved through literature review and the last through the Section 6.3).

6.2.1 Objective 2: Successful supply chain management strategies

A few reviews of the Sri Lankan garment industry have been written focusing only on the reasons for being the industry at risk. They have not been carried out to the extent of identifying the indicators of successful SCM strategies. Therefore this research is arguably the first empirical attempt of SCM practices in the garment manufacturing and exporting industry SMEs in Sri Lanka. The successful SCM practices were identified in relation to the three main indicators (lead time, value addition and direct contacts) as these were the dimensions of the success identified from the literature and initial exploratory interviews. Accordingly it was possible to identify 'more' and 'less successful 'companies in terms of SCM practices that have been implemented by Sri Lankan garment manufacturing and exporting industry SMEs. Three firms from each category of 'more' and 'less successful' companies agreed to participate in the research.

Several SCM strategies that are implemented by Sri Lankan garment manufacturing and exporting industry SMEs that lead to the achievement of shorter lead times were found to be: effective cell layout and operations planning, effective scheduling techniques: ERP MRP and JIT, high emphasis on team work, implementation of CAD, CAM and RFID,

implementation of 5S, working directly with foreign buyers, strong mutual understanding in the supply chain, successful uncertainties management in terms of volume and design variations, machine breakdowns, poor supply performance and moving planning delivery dates forward.

Successful SCM strategies that are being implemented to improve the value addition of products are: effective logistic cost management techniques, high level of quality management, innovations and low product development times, low range of products, productive employees and proper customer order path management.

Maintaining direct contacts with foreign buyers has brought about the benefits of improved profitability and business risk diversification, strong business network, and strong business relationship management in terms effective SCM strategies.

Even though the successful SCM practices were found in relation to each factor of lead time, value addition and direct contacts with foreign buyers, they are closely interrelated with each other. The SCM practices which aim to shorten lead time also result in improved added value to the final products and successful SCM practices in relation to direct contacts with foreign buyers support in reducing lead times and thereby improve added value. The ability to maintain direct contacts with foreign buyers can be regarded as a major reason for improved performance by means of shortening the supply chain. This has largely facilitated shorter lead times in three ways: a faster decision making process is assisted by smooth lines of communication; information sharing expedites problem solving and creating a strong business relationship with buyers and suppliers facilitating problem solving. Since dealing directly with foreign buyers has resulted in developing a strong business relationship management it has also paved the way for open negotiation over a higher price for the final garments. Neither of the case companies maintains formal contracts nor collaborations with buyers so it is worthwhile to notice the strong mutual understanding maintained with the buyers even in the absence of formal contracts. These companies also achieve a lower cost of production than the 'less successful' companies due to the lower costs involved in information handling, material movement planning, computer aided designing, managing customer order path effectively, low product development times, low range of products and high productive employees. Therefore the 'more successful' companies maintain a higher profit margin as

a result of the higher price of the final garments and lower cost of production in comparison with 'less successful' companies hence it is evident that the nature of supply chain relationship has significantly impacted on these companies. Because it was found that reducing lead times depends to a large extent on manufacturers' relationships with buying offices and first-tier suppliers. Furthermore, the higher profits experienced by 'more successful' companies creates the opportunity to invest in advanced manufacturing technologies of CAD and CAM, information and material handling techniques of ERP and MRP and employee training which, in turn, results in high productive employees. It is also evident that both lead time and value added related successful strategies are solely the indicators of internal supply chain efficiencies proving the fact of less control over the external supply chain as a result of case companies having to operate in a foreign-buyer-nominated market.

6.2.2   Objective 3: Constraints

While past studies about the Sri Lankan garment industry have reviewed the vulnerability factors of the industry, none of them specifically studied the reasons from an SCM perspective especially in SMEs at a micro level. This research studied these factors in detail and was also able to determine the constraints faced by SMEs to implement effective SCM strategies. The constraints were not only found from the 'less successful' companies but were more prominent in these cases.

The constraints that the Sri Lankan garment manufacturing and exporting industry SMEs face in relation to improving lead times were found to be: the absence of long term or short term contracts with suppliers and buyers, foreign-buyer-nominated market, frequent staff fluctuations and lack of team work orientation, inability to implement advanced information management and scheduling techniques, lack of fabric base found in Sri Lanka, less control over suppliers, limited machine and staff capacity, relatively lengthy supply chains of the companies that work with buying offices and top-down management.

The constraints that the case study SMEs experience in relation to improving the value addition to the products are the broad range of products, inadequate customer path management, insufficient employee training, lack of innovations and high product development times, no control over import and export charges (especially the price of oil, less effective in managing logistics cost and small quantity orders.

The companies that currently work with buying offices have failed to initiate direct contacts with foreign buyers due to constraints regarding the lack of resources, less effort is made to reach direct buyers, not being ready to accept business risk and poor business relationships with buying offices.

While many of constrains that are found by the research are supported by the previous body of knowledge it was noticed that some of the constraints are context specific: foreign-buyer-nominated market, less control over suppliers and no control over fuel, import and export charges. These are not explicitly mentioned in the literature exclusively as constraints to improve SCM strategies.

Most of the identified constraints are micro environmental factors which are internal to the case companies. Except the macro environmental factors of the lack of local fabric base, foreign-buyer-nominated market and uncontrollable import and export charges which are beyond the control of the case companies, the rest of the constraints relating to lead time, value added and direct contacts with foreign buyers are micro environmental factors. Further they can be identified as the weaknesses of the case companies and are existed due to four main internal reasons that leads to many other constraints inside the organisations; resistance to business risk, low profit margined niches, lack of business vision and lack of resources. The macro environmental factors, that can be considered as the threats of the case companies lead to many constraints outside the control of these organisations. The fact that these companies have to operate in foreign-buyer-nominated markets which is a macro environmental factor has an impact on certain micro environmental factors: lack of customer order path management and small quantity orders. The lack of fabric base within Sri Lanka is a factor in common inhibiting shorter lead times whereas the rest of the constraints are peculiar to each category of companies: 'less' and 'more successful'. Further the two main business models apparent in the Sri Lankan garment industry are: the manufacturers work through buying offices and the manufactures work directly with foreign buyers.

The lack of business vision and traditional business culture lie with the owners and managers of these companies have made them less effective in defining the strategic goals of the companies and therefore operational level strategies, such as logistic cost

reduction measures, are not properly linked with goals of the businesses. This has further affected, in the absence of low cost, lean management practices such as 5S and quality circles. Although this condition is common with both categories of companies, it is clearer among the 'less successful' companies. The lack of business vision and not being ready to accept the business risk hinder profit-making opportunities for the 'less successful' companies. For example, they have not even made any sort of effort to approach direct buyers. However these companies are assisted by the buying offices to overcome the obstacles of lack of marketing personnel, information technology and production capacity which have been reasons for the 'less successful' companies to work with buying offices. Further to this a healthy business relationship is not maintained between buying offices and 'less successful' companies as buying offices are being opportunistic by not providing the required information to these companies. Therefore according the theory of TCA it is apparent that asset specificity restricted these companies to discontinue unhealthy business relationships irrespective of the opportunistic behaviour of buying offices. The buying offices' resources are highly specialised to these companies to carry out their business operations which leads to increased opportunism as proposed by theory of TCA. This caused the 'less successful' companies to have less negotiation power over the final prices of the garments so often earn a low profit margin.

Low profit margins result in cash flow problems and weak financial background thereby preventing these companies from investing in advanced manufacturing, information systems and material handling technologies. Hence the cost of production is higher than the 'more successful' companies which make the condition poorer. Therefore as a means of improving added value to the final products the focus on cost minimisation has been the only possible way for these companies to develop. Although 'more successful' companies earn higher profit margins than 'less successful' companies still both types of companies are operated in foreign-buyer-nominated markets which leaves limited power over to the manufacturers regarding decision making of the supply chain. Moreover the small quantity orders have been another significant barrier for 'more successful' companies preventing them maximising the benefits of mass scale production. These companies offer their products to the low profit margined niches as a result of inherited weaknesses by being SMEs. The profitability of the niche markets have largely been

limited by poor supply chain management as a consequence of unhealthy market conditions such as buyer nominated market. Overall, the lack of fabric base within Sri Lanka can be identified as the main reason behind the factors of uncontrollable import and export charges, having to operate in a foreign-buyer-nominated market and small quantity orders that create higher manufacturing costs.

The lack of business vision of the owners/mangers of both types of companies leaving the supply chains was not reviewed for their performances so owners/managers are not aware of the weaknesses of supply chains which prevent them achieving the benefits of effectively integrated supply chains. These companies are internal-supply-chain-oriented so external supply chain operations are largely overlooked in terms of long term relationship management via collaborations and partnerships. Shorter lead times of 'more successful' companies have largely been possible due to internal supply chain efficiencies rather external supply chain.

However on the whole, irrespective of the opportunistic behaviour of the buying offices, it is argued that buying offices play a crucial role as an intermediary in terms of providing opportunity to the companies that do not possess the capacity to approach direct buyers. These companies have been able to survive in the market earning foreign exchange to the Sri Lankan economy as a result of the existence of the buying offices.

6.2.3   Objective 4: Success factors

The literature reviewed on supply chain management practices of SMEs and apparel industry manufacturing firms, together with empirical evidence from case studies, suggested that low-cost lean management practices such as 5S, quality circle and teamwork are the most feasible options for SMEs with low resource availability. However it is argued in the literature that textile and apparel manufacturing SMEs employ both agile and lean management strategies. The empirical evidence from the case studies carried out also supports this argument so it is a combination of lean and agile management perspectives that facilitates resource efficiency. The lack of management experience and business knowledge of the entrepreneurs and mangers of the chosen case study companies has inhibited them implementing low cost lean management practices. Agile management practices are also implemented to a limited extent as these companies operate in a buyer-nominated market so the lack of market information shared and top-

down organisational structures do not support to proper agile management practices. The nature of supply chain relationship plays an important role as both types of companies have limited control over their external supply chains. The absence of long or short term collaborations with suppliers and buyers have exposed these companies to a high risk business environment and these companies have made little effort to initiate long term collaborations with their business partners. Therefore it can be said that, in the Sri Lankan context, the nature of the supply chain relationship with suppliers and buyers is a decisive factor in choosing the best between agile, lean or leagility or combination of them.

6.3 Implications of the Research

This research has both theoretical and practical implications; both are which are considered herein.

6.3.1   Practical Implications

The finding that "companies should maintain a strong mutual understanding and a business relationship with buyers even in the absence of proper business contracts or collaborations" suggests that when market conditions are such that business collaborations are unlikely to form, owners/mangers should prioritise and preserve sound business relationships with supply chain members. Thereby problem solving in the supply chain will be faster and lead times will be reduced.

Research findings also shows that when the external supply chain efficiencies are unrealistic due to the nature of market conditions, focusing more on internal supply chains leads to properly streamlined internal supply chain operations thus short lead times and higher value added. Therefore it implies that when the external markets conditions are uncontrollable owners/mangers of firms should as a minimum consider achieving internal supply chain efficiencies in order to maintain competitive advantage.

The findings of this research further imply the importance of pursuing shorter supply chains. Therefore firms should consider avoiding intermediaries to shorten the supply chains to realise the benefits of; improved profitability and supply chain performance, strong business relationship and faster decision making which are then driving towards shorter lead times and high value added of the products.

Another important practical implication is that 'more successful' companies have gradually shifted from the business model of working with buying offices to working directly with buyers. Therefore an implication of this is the possibility for the 'less successful' companies to replicate and considering upgrading to working directly with foreign buyers. Moreover, 'UNIQLO' a Japanese manufacturer, which opened its first outlet in 1984, is now the biggest apparel chain in Asia. Its slogan is "made for all" and instead of chasing trends they focus on basic designs making garments affordable for everyone. Currently stores are opened worldwide and main locations are in New York, London, and Paris. France, Singapore, Malaysia, the Philippines, China and Taiwan are among the other countries. The implication of UNIQLO to the Sri Lankan garment industry is that the lack of backward integration or access to the market trends are not barriers to capture global market opportunities as long as a strong brand perception is created through careful market positioning. Even though UNIQLO is a Japanese brand 70% clothing is manufactured in China and it is not after the market trends so the unique selling proposition is cheap price and aiming to make affordable for every consumer (Business Insider, 2013).

6.3.2 Academic Implications

Many existing supply chain theories have been illustrated and confirmed in these case studies: the benefits of lean manufacturing, barriers to adopting agile manufacturing systems, the concept of social network theory, transaction cost approach, resource based view and agency theory.

Waste reduction of resources bring the benefits of shortened lead times and improved value added of products. Various incidents of waste reductions were evident in these case studies such as reduced set up times of machines, time saved in preventive maintenance of machines, time saved in cross-functional training of employees and time saved in shortening the supply chains.

The lesser the control over the external supply chain higher the inability to successfully implement agility. This made important information less available for the downstream supply chain members who are particularly affected when large scale players dominate the supply chain.

While SMEs lack tangible resources, intangible resources and capabilities play a key role in creating competitive advantage in SMEs as implied by the RBV. However the absence of socially complex capabilities such as sound organisational culture and the lack of business knowledge of the owners/managers cause an underutilisation and mismanagement of existing resources that can possibly have a negative impact on effective internal and external supply chain management. Therefore the lack of strategic thinking and planning of a firm's management and poor business culture tend to leave it far behind from realising the benefits of an effective supply chain management, especially in an SME.

The role of intermediaries is of prime importance from a point of view of agency theory. However the findings of this research show their opportunistic behaviour too, which diminishes the real value of the service provided as an agent due to asset specificity. In view of Transaction cost approach, asset specificity increases the opportunistic behaviour in a relationship. Further, this research demonstrates the importance of avoiding intermediaries thus shortening supply chains. This also benefits in shortened the lead times and improved value added in the industry. In general, an implication of these findings is such that, the higher the tiers in a supply chain the lower the value creation possible by effective SCM implementation.

Understanding the relative position in a supply chain is worth in the view of theory of SNT as it may leading a firm to be vulnerable in its supply chain, especially in the external supply chain.

The lack of backward integration of an industry leads to losing the competitive advantage of the market via high manufacturing cost and low value added keeping their external supply chains beyond their control. External supply chain innovations and efficiencies are also therefore unachievable which can possibly bring about further lead time reduction and high value added so that makes an industry less competitive in the long term.

Being small in size (SMEs) is a another challenge to successfully survive in a foreign buyer nominated market in terms of supply chain efficiencies so it can be said that the nature of the market a firm operates, exerts an considerable impact on the successful

implementation of SCM strategies especially, the external supply chain and it is even more with an SME.

Failure to link a firm's ERP and MRP systems with suppliers' and buyers' systems indicate that these internal investments cannot be utilised to the maximum as the real benefits of a properly integrated information system in the supply chain is unrealistic. Information sharing among supply chain partners can only be fully leveraged through business process integration. Yet process integration is undoubtedly due to the limited information sharing in the supply chain especially by the external parties. This further suggests that the players in a foreign buyer nominated markets can probably be trapped in a non-value adding commercial environment that results in diminished value of technological and operational investments so the market conditions has a significant impact on the ability to implement an effective information management system in a supply chain.

Strong business relationship and mutual understanding with the buyers enable an improved supply chain performance even in the absence of formal contracts or collaborations. Therefore it implies that formal business contracts or collaborations are always not required to pursuit a long term business relationship among the supply again members and the long term dependence on the same buyers also leads to develop a strong business relationship.

Although SMEs targeting niche markets have been able to successfully survive in the turbulent demand conditions (Storey, 1993), the findings of this research suggest that it is largely dependent on the nature of supply chain relationship and market conditions. Even though the case companies of this research target niche markets they are less profitable as a consequence of being victims of a foreign buyer dominated market.

6.4 Recommendations for Future Research

This research has thrown up many questions in need of further investigation from different perspectives: comparison between SMEs with large firms, factors behind asset

specificity of buying offices, the empirical relationship between the factors identified and SCM practices of SMEs in different research contexts.

The SCM practices of large firms in Sri Lanka's garment manufacturing and exporting industry can be studied with the intention of a logical comparison between SCM strategies of SMEs and large firms so that it will facilitate an understanding how large firms have been able to mitigate the barriers faced by SMEs. Further to this, consideration can be given to understanding the significance of large scale orders that large firms carry out since small quantity orders appears to be one of the major causes of higher manufacturing costs with SMEs. Furthermore, studying how large firms have developed strong relationships with foreign buyers is particularly worthwhile, as this is one of the main challenges faced by SMEs at the moment. In this context, further research could investigate whether there is a difference between large firms and SMEs in terms of the barriers to develop SCM practices revealed by this research (as elaborated in Section 2.3.2).

Further work needs to be done to empirically test the relationship between success indicators and constraints identified in this research. This would open up numerous research opportunities to carry out quantitative research as no studies were found to have been conducted in the Sri Lankan context specifically to investigate SCM practices in SMEs in Sri Lanka. Moreover these factors can empirically be tested within different research settings in various emerging economies.

Asset specificity has caused companies that work with buying offices to pursue this relationship irrespective of their opportunistic behaviour; further research can be conducted to explore this condition in detail. Researching this condition more broadly will lead to understand the other reasons apart from asset specificity for the motivation of less successful companies to work with buying offices even in a situation where a sound business relationship does not exist. A qualitative research will enable probing this condition in depth by addressing a sample only from the SMEs that work with buying offices.

This research is only focused on the SCM implementation of the Sri Lankan garment manufacturing and exporting industry and therefore further research can also be carried out in relation to SCM practices of SMEs in other industries so a more generalised perspective in terms of SCM implementation of SMEs in Sri Lanka can be obtained with SCM practices of different research settings.

6.5 Limitations

The findings in this research are subject to four main limitations; the research is based mostly on 'western' literature due to the lack of literature written specifically focused on Sri Lanka with regard to SCM and SME related theories. Past studies, based on other Asian countries, were also limited. However the researcher carefully considered materials relating to Sri Lanka and other emerging economies whenever they were available.

Social and cultural characteristics of study context also affected the data collection process. It was difficult to convince certain companies of the purpose of the research thus they refused to participate. This was further complicated when the researcher approached them by telephone from the UK, especially with regard to the collection of documentary evidence. Participants were concerned about revealing their business information, particularly from the 'less successful' category. However, the telephone contacts made did overall facilitate the collection of documents and conducting interviews in the second stage of data collection. To help gain the agreement of firms, the president of SLCGE was first approached and his referrals helped identify suitable case companies. However, one company in the 'less successful' category provided much less documentary evidence compared to other case companies.

The case selection for this research was based on three criteria that were developed based on the reviewed literature (theoretical sampling approach). Only three cases fulfilled the three criteria and they were classified as 'more successful' and another three from the rest of the SMEs that did not perfectly match the criteria agreed to participate in the research and were classified as 'less successful' companies. The research was therefore limited only to six cases. Further these six cases for the research were selected only from SLCGE registered SMEs and the time constraints of a commonwealth scholarship meant that researcher could not approach the SMEs that are not registered with SLCGE. If the researcher had been able to approach them, more SMEs that fulfilled the criteria for this

research could have been identified. Moreover the list of registered SMEs obtained from SLCGE did not provide, in all cases, up to date contact information which meant it was not possible to engage with all SLCGE member firms. Time constraints also meant it was possible only to study two buying offices as the researcher could only spend six weeks in Sri Lanka to conduct interviews.

Time limitations also restricted the researcher personally conducting the first stage interviews thus an experienced researcher with an SCM related background was employed. However, the researcher was successfully able to gather missing information from the first stage interviews as the researcher personally conducted all second stage interviews. Further the first stage interviews yielded a detailed background for each case, allowing for more detailed and pertinent interviews in the second stage.

6.6 Summary

This chapter, as the final part of the thesis, has reviewed the overall findings in accordance with the objectives of the research. The contributions that this research has made to the body of knowledge together with practical implications that might be of interest to the industry and academic implications have been suggested. Finally recommendations for future research and some limitations of conducting this research have been considered.

Having conducted this research, as a final key statement it can be said that the effectiveness of some garment manufacturing and exporting firms in Sri Lanka benefited from a virtuous circle of higher value added per employee, shorter lead times and direct contacts with foreign buyers. Further direct contacts with foreign buyers is a vital factor contributing to shorter lead times and higher value added. Initiating direct contacts with foreign buyers can thus contribute to the development of the industry.

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Appendices

Appendix A

Interview guide for the companies with direct contacts with their foreign buyers

First of all I would like to thank you for agreeing to participate in my research and offering your valuable time. It is much appreciated. I would like to introduce myself and the research. I would like to introduce myself and the research. My name is …….. and the objective of this research is to understand the supply chain management strategies being implemented in the garment exporting small and medium sized enterprises (SMEs) in Sri Lanka. The data being collected today is for research being undertaken by Renuka Herath at Newcastle University, UK, for a doctoral degree. The results of this research will help in the recommendation of strategies to overcome the obstacles the Sri Lankan garment exporting companies face in implementing effective supply chain management practices.

You have been selected for this research because you are the Logistics/Supply/Purchasing Manager of a garment manufacturing and exporting SME in Sri Lanka. I hope this conversation will be pleasant and interactive. However I would like to ask you to speak as clearly as possible because I will be recording the interview on this Dictaphone. Also please remember that there are no right or wrong answers, I am only seeking your opinions and knowledge about the supply chain management practices of your company.

To clarify some ethical concerns, there are no known risks of participation in this study, nor are there any costs involved. I must make you aware that the interview will be recorded for subsequent transcription; however this is only for making the data analysis as accurate as possible. Your participation is entirely voluntary and you're free to withdraw at any time without prejudice. All information will be handled in the strictest of confidence and no names of the persons or companies will be used in the write-up of the research.

Following this, let's start off by you explaining briefly the supply chain of your company referring to the members in it.

Let's now talk about **lead time** related issues. Just for your information, when I talk about 'lead time', I mean the time between an order is placed and when it reaches its final destination.

1. How do you maintain relationships with buyers?
   - Based on a legally bounded contract?
   - Your own mutually understood rules and procedures?

2. How do you maintain relationships with suppliers?
   - Based on a legally bounded contract?
   - Your own mutually understood rules and procedures?

3. How do you transmit and manage information in the supply chain?
   - Using the techniques such as Enterprise Resource Planning (ERP), Radio Frequency Identification (RFID), Material Requirement Planning (MRP) and MRP II or manually?

   - How do you use these techniques?
   - What are the different situations you use these different techniques?
   - Can you please outline the reasons for why you are being unable to implement these information management techniques?
   - What is most commonly used when transmitting information, electronic or manual means?

4. How do you deal with the uncertainties in the supply chain?

5. How it affect the on time despatching of the order?
   - Volume and design variations
   - Machine breakdowns
   - Poor supplier performance
   - Managing manufacturing operations
   - Moving forward planned delivery dates

What measures do you take when you cannot deal with above uncertainties with the existing resources?

   - Acquire**?**
   - Build**?**
   - Outsource the new resources needed**?**
   - Anything else?

6. Do you implement the following?
   - Just in time (JIT),

- Computer Aided Manufacturing (CAM)
- Computer Aided Designing (CAD)
- 5S
- Emphasis on teamwork in assigning responsibilities

7. Why do you/ do not implement the following?

- Just in time (JIT),
- Computer Aided Manufacturing (CAM)
- Computer Aided Designing (CAD)
- 5S
- Emphasis on teamwork in assigning responsibilities

8. Is your production based on forecasted demand or actual demand or a combination of both?

If you are manufacturing on forecasted demand;
- Based on what factors you forecast the demand?
- What techniques do you use to forecast demand, is it based on intuition and experience or mathematical techniques?
- What is the product finalisation (final assembly) point in the supply chain?

9. How do factory layout and operations help or hinder finishing orders on time? For example;
- Can you describe the cell layout (the way how the machines are grouped) of your factory?
- Why you have used this particular way?
- How do you maintain the link between the factory and the management?
- How do materials flow through the manufacturing process in the factory, is it depending on operators at the downstream work stations or just initiate the material movement?
- What is the approach for maintaining equipment and machines in the factory? Do you wait until you find any breakdowns to take corrective actions or proactive actions are taken before they breakdown?
- How effectively do you deal with setting up the machines when you have to change from one type of garment to another?
- For how long are inventories stored on average (materials, work in progress or finished) in the factory?

Value addition related

1. Can you please describe what kind of a range of products is manufactured by your organisation?

2. Can you explain to me how does your company perform in the following areas?

- What is the logistics cost as a percentage of total cost?
- How do you attempt to reduce the logistics cost?
- What is the information processing cost as a percentage of total logistics cost?
- What measures have you taken to reduce the information processing cost?
- What is the total transport cost as a percentage of total logistics cost?
- How do you attempt to reduce the transport cost?
- What is the additional cost of adding a new garment in the products as a percentage of total logistics cost?
- What the product development cycle time on average?
- Have you taken any measures to reduce the time and cost of new product development?
- What are the rates of defective products in house and by buyers?
- How do you attempt to reduce the rejections from buyers and in house?

3. What you can say about the productivity of the employees in your organisation?
- Do you train the employees in multi functions?
- Do you involve employees in decision making and problem solving processes by any means?
- Do you have a separate Research and Development staff? If you have, how many employees work in Research and Development staff and in your opinion are they creative enough?

- Are you aware of your customer order path?
- Is it physically mapped in a business plan?
- Do you have any idea of the time the products/materials stay in each of its channels in the customer order path such as delays in paper work, times in the warehouse and checking for rejections?
- If so, have you come across any unnecessary channels that order comes through?

4. How do you ensure the quality of your products?
- Do you implement a Total Quality Management approach?
- If so how do you do that?
- Have you developed any special quality checking systems?

363

- If so what are they?
- How do you implement them?

Now let's talk about the relationship your company has with its **direct contacts**.

1. How did you identify your potential buyers in the first place?
   - Was there any time you worked via local buying offices of foreign buyers?
   - How long have you had direct contacts with your foreign buyers?
   - What made you to initiate working with your buyers directly?

2. How do you source raw materials?
   - What are the countries from which you import the raw materials?
   - As a percentage how much of the required raw material is imported from abroad?

3. Are there any special reasons for you to select these particular buyers and suppliers over any other buyer or supplier? Such as:
   - The cost
   - The help of business friends, family friends or relatives
   - Any other reasons

4. How do you describe the relationship you have with your buyers and suppliers?
   - Can you trust your suppliers and buyers?
   - Do they always keep the promises they made?
   - Do they share with you all the information valuable to you such as point of sales data, promotion plans and schedules, customer targets and demand forecasts?
   - Do you share information such as advance shipping notices and production schedules with your suppliers and buyers?
   - Do you mutually assist in solving problems of each other?
   - Have you ever found any situation they have worked merely for their own benefit?
   - Can you tell me about a situation they ever made any sacrifice to maintain the relationship they have with your organisation?
   - Do you feel that the relationships your network of suppliers and buyers have with you are important for them?
   - How important are the relationships you have with your buyers and suppliers in terms of the benefits you receive from them?

So that's the end of the interview. Thank you very much indeed for your time. Is there anything else you would like to add before we finish?

Interview guide for the companies without direct contacts with their foreign buyers

First of all I would like to thank you for agreeing to participate in my research and offering your valuable time. It is much appreciated. I would like to introduce myself and the research. I would like to introduce myself and the research. My name is …….. and the objective of this research is to understand the supply chain management strategies being implemented in the garment exporting small and medium sized enterprises (SMEs) in Sri Lanka. The data being collected today is for research being undertaken by Renuka Herath at Newcastle University, UK, for a doctoral degree. The results of this research will help in the recommendation of strategies to overcome the obstacles the Sri Lankan garment exporting companies face in implementing effective supply chain management practices.

You have been selected for this research because you are the Logistics/Supply/Purchasing Manager of a garment manufacturing and exporting SME in Sri Lanka. I hope this conversation will be pleasant and interactive. However I would like to ask you to speak as clearly as possible because I will be recording the interview on this Dictaphone. Also please remember that there are no right or wrong answers, I am only seeking your opinions and knowledge about the supply chain management practices of your company.

To clarify some ethical concerns, there are no known risks of participation in this study, nor are there any costs involved. I must make you aware that the interview will be recorded for subsequent transcription; however this is only for making the data analysis as accurate as possible. Your participation is entirely voluntary and you're free to withdraw at any time without prejudice. All information will be handled in the strictest of confidence and no names of the persons or companies will be used in the write-up of the research.

Following this, let's start off by you explaining briefly the supply chain of your company referring to the members in it.

Let's now talk about **lead time** related issues. Just for your information, when I talk about 'lead time', I mean the time between an order is placed and when it reaches its final destination.

1. How do you maintain relationships with buyers?
   - Based on a legally bounded contract?
   - Your own mutually understood rules and procedures?

2. How do you maintain relationships with suppliers?
   - Based on a legally bounded contract?
   - Your own mutually understood rules and procedures?

3. How do you transmit and manage information in the supply chain?
   - Using the techniques such as Enterprise Resource Planning (ERP), Radio Frequency Identification (RFID), Material Requirement Planning (MRP) and MRP II or manually?

   - How do you use these techniques?
   - What are the different situations you use these different techniques?
   - Can you please outline the reasons for why you are being unable to implement these information management techniques?
   - What is most commonly used when transmitting information, electronic or manual means?

4. How do you deal with the uncertainties in the supply chain?

5. How it affect the on time despatching of the order?
   - Volume and design variations
   - Machine breakdowns
   - Poor supplier performance
   - Managing manufacturing operations
   - Moving forward planned delivery dates

What measures do you take when you cannot deal with above uncertainties with the existing resources?

   - Acquire**?**
   - Build**?**
   - Outsource the new resources needed**?**
   - Anything else?

6. Do you implement the following?
   - Just in time (JIT),
   - Computer Aided Manufacturing (CAM)
   - Computer Aided Designing (CAD)
   - 5S and Emphasis on teamwork in assigning responsibilities

7. Why do you/ do not implement the following?

- Just in time (JIT),
- Computer Aided Manufacturing (CAM)
- Computer Aided Designing (CAD)
- 5S
- Emphasis on teamwork in assigning responsibilities

8. Is your production based on forecasted demand or actual demand or a combination of both?

If you are manufacturing on forecasted demand;
- Based on what factors you forecast the demand?
- What techniques do you use to forecast demand, is it based on intuition and experience or mathematical techniques?
- What is the product finalisation (final assembly) point in the supply chain?

9. How do factory layout and operations help or hinder finishing orders on time? For example;
- Can you describe the cell layout (the way how the machines are grouped) of your factory?
- Why you have used this particular way?
- How do you maintain the link between the factory and the management?
- How do materials flow through the manufacturing process in the factory, is it depending on operators at the downstream work stations or just initiate the material movement?
- What is the approach for maintaining equipment and machines in the factory? Do you wait until you find any breakdowns to take corrective actions or proactive actions are taken before they breakdown?
- How effectively do you deal with setting up the machines when you have to change from one type of garment to another?
- For how long are inventories stored on average (materials, work in progress or finished) in the factory?

Value addition related

1. Can you please describe what kind of a range of products is manufactured by your organisation?

2. Can you explain to me how does your company perform in the following areas?

- What is the logistics cost as a percentage of total cost?
- How do you attempt to reduce the logistics cost?

- What is the information processing cost as a percentage of total logistics cost?
- What measures have you taken to reduce the information processing cost?
- What is the total transport cost as a percentage of total logistics cost?
- How do you attempt to reduce the transport cost?
- What is the additional cost of adding a new garment in the products as a percentage of total logistics cost?
- What the product development cycle time on average?
- Have you taken any measures to reduce the time and cost of new product development?
- What are the rates of defective products in house and by buyers?
- How do you attempt to reduce the rejections from buyers and in house?

3. What you can say about the productivity of the employees in your organisation?
   - Do you train the employees in multi functions?
   - Do you involve employees in decision making and problem solving processes by any means?
   - Do you have a separate Research and Development staff? If you have, how many employees work in Research and Development staff and in your opinion are they creative enough?

   - Are you aware of your customer order path?
   - Is it physically mapped in a business plan?
   - Do you have any idea of the time the products/materials stay in each of its channels in the customer order path such as delays in paper work, times in the warehouse and checking for rejections?
   - If so, have you come across any unnecessary channels that order comes through?

4. How do you ensure the quality of your products?
   - Do you implement a Total Quality Management approach?
   - If so how do you do that?
   - Have you developed any special quality checking systems?
   - If so what are they?
   - How do you implement them?

Direct contacts related

1. Why do you not have direct contacts with buyers?
   - Lack of resources
   - Lack of network

- Lack of trust or any other reason
- Prefer not to have direct contacts

2. How do you source raw materials?
   - What are the countries from which you import the raw materials?
   - As a percentage how much of the required raw material is imported from abroad?

3. Are there any special reasons for you to select these particular suppliers and buying office over any other suppliers and buying offices? Such as:
   - The cost
   - The help of business friends, family friends or relatives
   - Any other reasons

4. How do you describe the relationship you have with your buying office and suppliers?
   - Can you trust your suppliers and buying office?
   - Do they always keep the promises they made?
   - Do they share with you all the information valuable to you?
   - Do you share information such as advance shipping notices and production schedules with your suppliers and buying office?
   - Have you ever found any situation they have worked merely for their own benefit?
   - Can you tell me about a situation they ever made any sacrifice to maintain the relationship they have with your organisation?
   - Do you feel that the relationships your network of suppliers and buying office have with you are important for them?
   - How important are the relationships you have with your buying office and suppliers in terms of the benefits you receive from them?

So that's the end of the interview. Thank you very much indeed for your time. Is there anything else you would like to add before we finish?

SCM practices		Factors decide the SCM practice	Lead time related	Value addition related	Direct contacts related	References
Lean Manufacturing	Reduced set up time	Machine tool setup times	✓			Gunasekaran *et al.*(2004), Rose *et al.*(2011)
	Kanban, Visual control, Focused factory, Visual control, Standardisation	Shop floor control	✓	✓		Bruce *et al.*(2004); Rose *et al.*(2011)
	Small lot size	Size of the inventory	✓	✓		Rose *et al.*(2011)
	Supplier management	Nature of the contracts (Long term or short term, way the relationships are managed- authoritative, contractual , normative control or a combination of these	✓			Weitz and Jap(1995), Treville *et al.*(2004), Rose *et al.*(2011)

			three mechanisms)					
		Preventive maintenance	Maintenance of equipments and machines	✓	✓			Rose *et al.*(2011)
		Multifunction employees	Product development cycle time(availability of cross functional teams)	✓	✓			Gunasekaran *et al.*(2004), Rose *et al.*(2011) Schonberger (1990)
		Cell layout	(Modular sewing cells and laser fabric cutting)	✓	✓			Chan and Chan, (2010), Rose *et al.*(2011)
		Employee involvement (quality circles)	Employee feedback		✓			Rose *et al.*(2011)
		Total quality management	Infrastructure and human resource quality		✓			Clements and Price (2007), Rose *et al.*(2011)
			Rate and cost of the defective products	✓	✓			Banomyong and Supatn (2011), Rose *et al.*(2011)
		Training	Cross train of employees	✓	✓			Rose *et al.*(2011)
		Teamwork	Assigning responsibilities	✓				Rose *et al.*(2011), Harrington *et al.* (2003)

	Kaizen (continuous improvement)	Innovation(new product development-R&D activities)	✓	✓		Kaplan and Norton (1996), Rose *et al.*(2011) Petersen *et al.*(2005)
	5s	Organisation, neatness, cleanliness, standardisation, discipline	✓	✓		Rose *et al.*(2011), Rothenburg and Cost (2004)
	Continuous flow	Analysis of customer order path (to avoid non value adding activities)		✓		Gunasekaran *et al.*(2004), Rose *et al.*(2011)
		Understanding of total distribution cost (to avoid tradeoffs in distribution costs)		✓		Thomas and Griffin, (1996), Candace *et al.* (2011),Hummel (2007)
	Focused factory	Shop floor control	✓	✓		Bruce *et al.*(2004), Rose *et al.*(2011)
Agile Manufacturing	ERP	Means of managing and sharing information, Level of information asymmetry	✓	✓		Treville *et al.*(2003), Jena *et al.*(2011),Brewer and Speh, (2000), Candace *et al.* (2011), Roberts, (2003), Chan and Chan, (2010), Soon and Gutiérrez, (2002)
		Elimination of paper work	✓	✓		Treville *et al.*(2004)
		Collaborative partnerships	✓			Gunasekaran *et al.*(2004), Camarinha-Matos and Afsarmanesh (2003)

		Effectiveness of scheduling techniques (JIT, MRP, ERP)	✓				Gunasekaran *et al.*(2004), Gunasekaran *et al.*(2001)
	QR, RFID, EDI, CAD,CAM	Length of the supply chain	✓				Treville *et al.* (2004), Doyle *et al.*(2006)
		Information processing cost (Modern information technology tools)		✓			Stewart (1995), Cai *et al.*(2006)
		Mutual cooperation (collaborative relationships)		✓	✓		Clements and Price(2007)
		Credibility (to what extent keeps the promise)			✓		Van Bruggen *et al.*(2005)
		Dependence (how crucial the benefits received from the relationship)			✓		Frazier (1983), Pfeffer and Salancik (1978)
		Long term orientation of the relationships with the buyers		✓	✓		Lee and Dawes (2005), Theodorakioglou *et al.*(2006), Buttle (1996)
		Opportunistic behaviour of the partners of the supply chain			✓		Barney (1986), Nootboom, (1993), Jena *et al.*(2011), Cousin *et al.*(2008)
	MRP	Effectiveness of scheduling techniques	✓				Gunasekaran *et al.*(2004), Gunasekaran *et al.*(2001)

		for MRP					
	MRPII	Effectiveness of scheduling techniques for MRPII	✓				Gunasekaran *et al.*(2004), Gunasekaran *et al.*(2001)
	FMS	Flexibility – Volume flexibility	✓				Slack, (1991), Pinto,(1998), Poolton *et al.*(2006)
		Human resource productivity	✓	✓			Gunasekaran *et al.*(2004)
		Mix flexibility	✓				Slack, (1991), Pinto,(1998), Poolton *et al.*(2006)
		New product flexibility	✓	✓			Slack, (1991), Pinto,(1998), Poolton *et al.*(2006)
		Productivity of assets in a supply chain(accounts receivable, plant, property and equipment and inventories)		✓			Gunasekaran *et al.*(2004)
	Flexibility	Flexibility with seasonality, machine breakdowns, poor supplier performance, managing manufacturing operations and new markets and competitors	✓				Beamon (1999), Candace *et al.* (2011), Gunasekaran *et al.*(2001), Loker(2002)
		Economies of Scope	✓				Christopher(1992)
		The range of products		✓			Mapes *et al.*(1997)
		Level of uncertainty	✓	✓			Cousin *et al.* (2008)

		comes from the business environment				
	Delivery flexibility	Level of flexibility with uncertainties in delivery	✓			Slack (1991), Pinto (1998), Poolton *et al.*(2006)
		Shipping errors(number of incorrect shipments made)	✓			Beamon (1999)
Leagility	Postponement	Implementation of postponement in manufacturing process	✓	✓		Brewer and Speh (2000), Yeh and Yang (2003)
		Accuracy of forecasting measures	✓			Gunasekaran *et al.*(2004), Banomyong and Supatn (2011), Bruce *et al.*(2004)
Barriers of adopting effective SCM strategies	Resource and cost based barriers	Build or acquire Collaborations with large firms Handling uncertainties opportunism	✓	✓	✓	Barney (2001), Qian and Li (2003),O'Regan *et al.* (2005) , Quesada *et al.* (2012)
	Network and partnership based barriers	Trust Informal social networks and relationships Collaborative partnerships Information asymmetry	✓	✓	✓	Aodheen and Cummins (1999), Welford and Frost (2006), McMahon (2004), Cristea and Oregon (2011)

Appendix C

Interview guide for buying offices

1. Can you please describe the role you play as an intermediary between the foreign buyers and the manufacturing companies?
   - How do you select the manufacturers for your orders?
   - What are the requirements (compliances) they have to meet?
   - Are 5S and CAM parts of it?
   - If not, why not?

2. Why do the manufacturing companies work through the buying offices?
   - Why can't contact deal with buyers directly?

3. Who is responsible for supplying fabric and accessories, manufacturer or you?
   - Do you always nominate the suppliers for accessories? If so why?
   - How do you ensure the quality of the accessories when the manufacturer sourced them by themselves?
   - Why the buyers always need to send fabric? Why the manufacturers can't source the fabric by themselves?
   - How long in advance the buyer sends the fabric for the manufacturers?
   - Why they send them that early?
   - When the buyer confirm the details of the order such as quantity and delivery dates, is it always the same or does it change in the middle? If so, how do you manage to deal with this kind of conditions with the manufacturers?

4. How do you maintain relationships with buyers and manufacturers?
   - Based on a legally bounded contract?
   - Your own mutually understood rules and procedures?
   - Why you don't work based on a legal contract?
   - How the payments are arranged between the foreign buyers and manufacturers?

5. How do you transmit and manage information in the supply chain?
   - How do you manage information with the buyers?
   - Why you don't use any advance information transmitting techniques such as ERP when exchanging information with the manufacturers?

6. Who is responsible for arranging the containers and booking the vessels for freight of the goods?

7. What mechanisms are in place to ensure the quality of garments?

- Who is responsible for any defect found by the buyers in the garments when they arrived its final destination, is it you or the manufacturer?

8. Do you share any information with buying offices?

9. Are buying offices required to share necessarily any information with you such as their production schedules?

10. How did you find the factories currently you are working with?
    - How important is maintaining a good relationship with your factories?
    - Can you easily find a new manufacturer for your orders or rather you tend to work with whom you have been working with?
    - Do you assist them whenever they get a problem with an order such as if they get delayed by their accessories suppliers?
    - Why the manufacturers prefer to work with buying offices?

Appendix D

Node structure

Hierarchical Name	Nickname	Aggregate

Node

Nodes

Nodes\\line		No

Nodes\\Case studies attributes

Nodes\\Case studies attributes\\Buying Office- A		No
Nodes\\Case studies attributes\\Buying Office-B		No
Nodes\\Case studies attributes\\Company- A		No
Nodes\\Case studies attributes\\Company- B		No
Nodes\\Case studies attributes\\Company -C		No
Nodes\\Case studies attributes\\Company -D		No
Nodes\\Case studies attributes\\Company -E		No
Nodes\\Case studies attributes\\Company -F		No

Nodes\\Themes

Nodes\\Themes\\Direct contacts- barriers		Yes
Nodes\\Themes\\Direct contacts- barriers\Lack of resources and required compliances		No
Nodes\\Themes\\Direct contacts- barriers\Less effort made to reach direct buyers		No
Nodes\\Themes\\Direct contacts- barriers\Not ready to accept business risk		No
Nodes\\Themes\\Direct contacts- barriers\Poor business relationship management with buying offices		No
Nodes\\Themes\\Direct contacts- Successful strategies		No
Nodes\\Themes\\Direct contacts- Successful strategies\Improved profitability and business risk diversification		No
Nodes\\Themes\\Direct contacts- Successful strategies\Strong business network		No
Nodes\\Themes\\Direct contacts- Successful strategies\Strong business relationship management		No
Nodes\\Themes\\Lead Time- Successful strategies		No
Nodes\\Themes\\Lead Time- Successful strategies\Effective cell layout and operations planning		No
Nodes\\Themes\\Lead Time- Successful strategies\Effective information management techniques (ERP, MRP)		No
Nodes\\Themes\\Lead Time- Successful strategies\High emphasis on team work		No
Nodes\\Themes\\Lead Time- Successful strategies\Implementation of CAD, CAM, RFID		No
Nodes\\Themes\\Lead Time- Successful strategies\Implementtaion of 5S		No
Nodes\\Themes\\Lead Time- Successful strategies\Relatively shorter supply chains		No

Nodes\\Themes\\Lead Time- Successful strategies\Strong mutual understanding in the supply chain	No
Nodes\\Themes\\Lead Time- Successful strategies\Succesful uncertanities	No
Nodes\\Themes\\Lead time-barriers	Yes
Nodes\\Themes\\Lead time-barriers\Absence of long or short term contracts with suppliers and buyers	No
Nodes\\Themes\\Lead time-barriers\Foreign buyer nominated market	No
Nodes\\Themes\\Lead time-barriers\Frequent staff fluctuations and lack of team work orientation	No
Nodes\\Themes\\Lead time-barriers\Inability to implement advanced information management and scheduling techniques	No
Nodes\\Themes\\Lead time-barriers\Lack of fabric base found in Sri Lanka	No
Nodes\\Themes\\Lead time-barriers\Less control over suppliers	No
Nodes\\Themes\\Lead time-barriers\Limited machine and staff capacity	No
Nodes\\Themes\\Lead time-barriers\Relatively lengthy supply chains	No
Nodes\\Themes\\Lead time-barriers\Top- down management	No
Nodes\\Themes\\Value addition- Successful strategies	No
Nodes\\Themes\\Value addition- Successful strategies\Effective logistics cost management techniques	No
Nodes\\Themes\\Value addition- Successful strategies\High level of quality	No
Nodes\\Themes\\Value addition- Successful strategies\Innovations and low product development times	No
Nodes\\Themes\\Value addition- Successful strategies\Low range of products	No
Nodes\\Themes\\Value addition- Successful strategies\Productive employees	No
Nodes\\Themes\\Value addition- Successful strategies\Proper customer order path management	No
Nodes\\Themes\\Value addition-barriers	Yes
Nodes\\Themes\\Value addition-barriers\High range of products	No
Nodes\\Themes\\Value addition-barriers\Inadequate customer order path	No
Nodes\\Themes\\Value addition-barriers\Insufficient employee training	No
Nodes\\Themes\\Value addition-barriers\Lack of innovations and high product development times	No
Nodes\\Themes\\Value addition-barriers\Less effective in logistics cost management	No
Nodes\\Themes\\Value addition-barriers\No control over fuel, import and export charges	No
Nodes\\Themes\\Value addition-barriers\Small quantity orders	No

Relationship

Relationships

Relationships\\Effective information management techniques (ERP, MRP) (Can influence) Lead Time- Successful strategies	No

Results Node

Results

Results\\Direct contacts barriers and value addition barriers

Attribute Value	Attribute Value Description	Number of Nodes

Classification Name: Case Studies

Attribute Name: Case Name

A		1
A-Buying office		1
B		1
B- Buying office		1
C		1
D		1
E		1
F		1

Attribute Name: Direct Contacts

No		3
Not Applicable		2
Yes		3

Attribute Name: Interviewers

Managing Director		2
Managing Director, Merchandiser		2
Managing Director, Purchasing Manager		3
Managing Directors, Mktg and Production		1

Attribute Name: Lead Time

120-140		2
120-150		1
30-90		1
90		2

Attribute Value	Attribute Value Description	Number of Nodes
Not Applicable		2

Attribute Name: Range of Products

High		2
Low		4
Not Applicable		2

Attribute Name: Type

Buying Office		2
Manufacturing Company		6

Attribute Name: Types of products

Industrial uniforms and fashion garments		1
Ladies' Garments		2
Ladies', children's and men's wear		2
Not Applicable		2
Shirts and ladies' blouses		1

Attribute Name: Value addition per employee

10862		1
11162		1
15714		1
7500		1
8130		1
8527		1
Not Applicable		2

How different sources discuss about barriers to lead time

Appendix G

Case classification

Case Studies	Case Name	Direct Contacts	Interviewers	Lead Time	Product range	Type	Types of products	Value added per employee	Level of Successfulness
Nodes\\Case studies attributes\\Buying Office-1	1- Buying office		Managing Director			Buying Office			
Nodes\\Case studies attributes\\Buying Office-2	2- Buying office		Managing Director			Buying Office			
Nodes\\Case studies attributes\\Company- A	A	Yes	Managing Director, Purchasing Manager	90	Low	Manufacturing Company	Shirts and ladies' blouses	10862	More Successful
Nodes\\Case studies attributes\\Company- B	B	Yes	Managing Director, Purchasing Manager	30-90	Low	Manufacturing Company	Industrial uniforms and fashion garments	15714	More Successful
Nodes\\Case studies attributes\\Company -C	C	Yes	Managing Director, Purchasing Manager	90	Low	Manufacturing Company	Ladies' Garments	11162	More Successful
Nodes\\Case studies attributes\\Company -D	D	No	Managing Director, Merchandiser	120-150	Low	Manufacturing Company	Ladies' Garments	8527	Less Successful
Nodes\\Case studies attributes\\Company -E	E	No	Managing Director, Merchandiser	120-140	High	Manufacturing Company	Ladies', children's and men's wear	7500	Less Successful
Nodes\\Case studies attributes\\Company -F	F	No	Managing Directors, Mktg and Production	120-140	High	Manufacturing Company	Ladies', children's and men's wear	8130	Less Successful

Appendix H

Lead Time Related Successful SCM Strategies

Appendix I

Grading sheet with CAD system

385
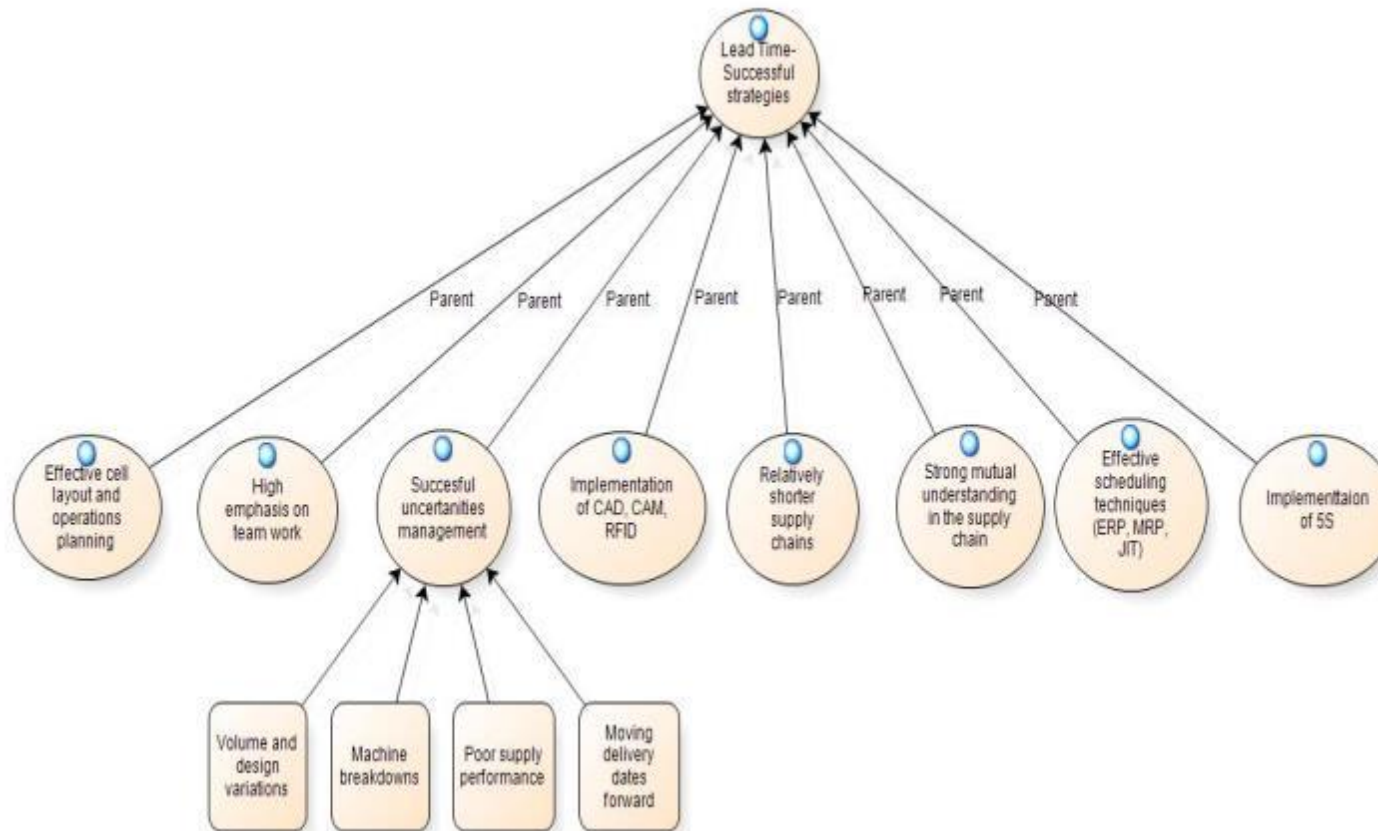
Technical specifications

technical specification   2011 08-30

model: unisex trousers
art no. 2500300

Labeling

main label

45 mm

at work

60 mm
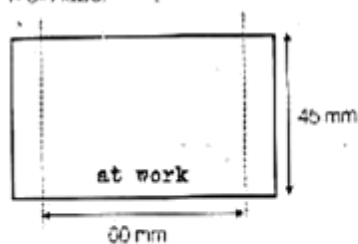
Fireflo ded woven label (Tod 110 5)
Placement at left hand side when wearing, at
pocket bag, 2 cm below waistband.
Stitched on all 4 sides.

Size label

seam allowence 8 mm

30

1 cm

1cm
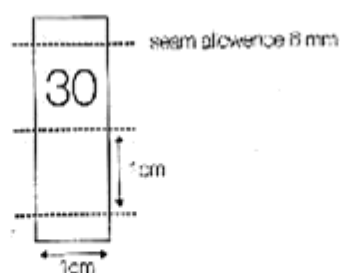
Woven label
White with black letters.
Placement centered back below waistband

Care label

4 cm

1 cm

65% polyester
35% cotton

10 cm

Model: Trousers unisex
Art no: 2500300
Order no: XXXX
Prod year-code: XXXX-XX

1 cm
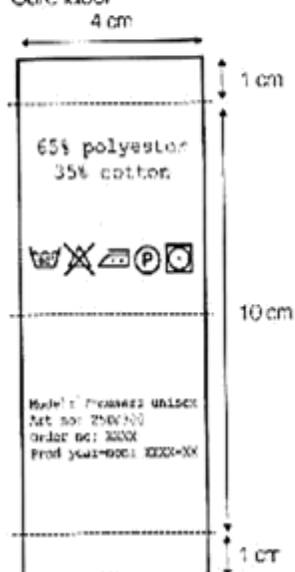
Printed care label
White with black letters.
Placement on left hand side when wearing,
inside seam, 10 cm from waist band.
Fill in correct info according to PO.

Placement inside labels

Center back   Side seam   Center front

size label

care label

main label

386
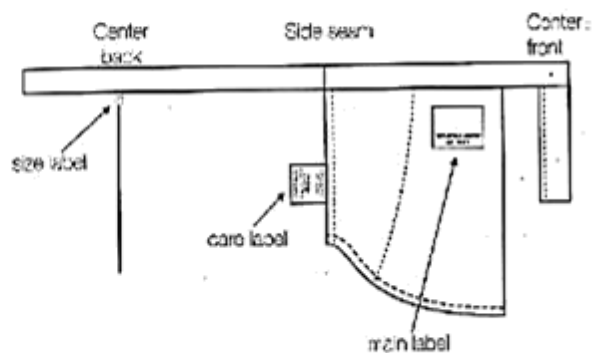
Appendix K

Measurement sheet (example)

SON MARCHE Specification Sheet

Date:	20-Jul-11
Buyer:	Catrin Cousins
Technologist:	Karen Foxton
Manufacturer:	BMS
Description:	Glitter Lace Tunic
Style number:	044045
Supp ref. Number:	FU9935
Composition:	
Comments:	

Size 12 and 20 PP samples have been fitted

General fit is good, thankyou

Please bring measurement discrepancies back to chart

Please submit production samples in size 12 and 20

approved Size

2011 8 9

on Marche Jubilee Way, Grange Moor, Wakefield, WF4 4SJ
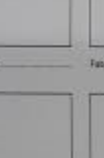
All measurements are flat and in cm
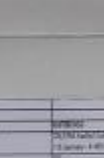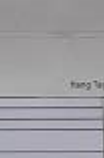
	BODY PARTS / SIZE	Measurement point	12			14	16	18	20			22	24	TOL +/-
A	SHOULDER	Measured from neck edge to sleeve head	7		ok	7.3	7.6	7.9	8.2		ok	8.5	8.8	0.5
B	SHOULDER DROP	Measured from imaginary line at shoulder to armhole edge of shoulder	2		ok	2	2	2	2		ok	2	2	0.5
C	ACROSS FRONT	Measured 15cms from snp	34		ok	35.2	36.4	37.6	38.8		+0.7	40	41.2	0.5
D	BUST FLAT (at 2.5cm underarm)	Measured at 2.5cm down from underarm	45	+0.5		47.5	50	53.25	56.5		ok	59.75	63	1
E	WAIST FLAT		43.5	+0.5		46	48.5	51.75	55		ok	58.25	61.5	1
		waist position taken from SNP	38			38.5	39	39.5	40			40.5	41	
F	HIP FLAT	Taken at 20cm below waist position	50		ok	52.5	55	58.25	61.5		ok	64.75	68	1
G1	HEM FLAT	Measured flat across the hemline at back hem	52		+1	54.5	57	60.25	63.5		+1	66.75	70	1
H1	BACK BODY LENGTH (from S.N	Measured from side neck at natural fold line neck trim to hem edge at BACK	74		-1	75	76	77	78		-1	79	80	1
H2														
I	BACK NECK WIDTH	Measured from edge to edge	23	+0.5		23.6	24.2	24.8	25.4		+0.5	26	26.6	0.5
J	BACK NECK DROP From IL	Measured from ring line at snp to top of neck	3	-0.5		3	3	3	3		+0.5	3	3	0
K1	FRONT NECK DROP From IL	Measured from ring line at snp to top of neck	16.5		ok	16.5	17	17	17.5		ok	17.5	18	0
L														
M	ARMHOLE STRAIGHT	Measured from sleeve head to armhole point	20		ok	20.6	21.2	21.8	22.4		ok	23	23.6	0.5
N1	OVERARM SLEEVE	Crown to sleeve end	26		+1	26.6	27.2	27.8	28.4		+1	29	29.6	0.5
N2	UNDERARM SLEEVE LENGTH		14		ok	14	14	14	14		ok	14	14	0.5
P	BICEP	Measured 2.5cm below centre	14		+0.5	14.6	15.2	16.1	17		+0.5	17.9	18.8	0.5
R	SLEEVE OPENING	Measured flat a armhem	12		ok	12.6	13.2	14.1	15		ok	15.9	16.8	0.5
S	ACROSS BACK	Measured in 15cms across rib neck seam	36.5		ok	37.7	38.9	40.1	41.3		ok	42.5	43.7	0.5
U	HANGER loop LENGTH	Positioned 2cm in from the neck edge	30		ok	30.6	31.2	31.8	32.4		ok	33	33.6	0.5
V														

Appendix L

Trim card (example)

Appendix M

Order confirmation (example)

Appendix N

Invoice (example)

Button Art No	Logo	Size	Hole	Colour	Quantity	Unit Price USD	Amount USD
CXB 3905-16/4-C(P)-FS		16	4	0022	100.000 Grs	0.8000	80.00
				Total QTY	100.000 Grs	Sub Total USD	80.00

	TOTAL	100.000 Grs	USD	80.00

TOTAL : USD EIGHTY ONLY

DELIVERY NOTE : 14 WORKING DAYS FROM THE DATE OF FINAL CONFIRMATION

VALIDITY : TWO WEEKS FROM THE DATE OF PROFORMA INVOICE

REMARKS : PLEASE SIGN THIS P.I. AND STAMP YOUR COMPANY CHOP
AND FAX BACK TO US AS CONFIRMATION OF THIS ORDER.
WE DO NOT ACCEPT CANCELLATIONS OR REDUCTIONS OF QUANTITIES.
WILL NOT PROCEED PRODUCTION UNTIL WE RECEIVE THE SIGNED P.I.
* ANY SHORTAGE COMPLAINT SHOULD BE ADVISED WITHIN 7 DAYS AFTER DELIVERY ARRIVES.
* COLOUR VARIATION OF (+OR-) 5% IS ALLOWED FROM THE APPROVED COMMODITY COLOR.
* ALL THE TESTING CHARGES HAS TO BE BORNE BY THE CUSTOMER

PAYMENT TERMS : ONE MONTH FROM DELIVERY DATE

BUYER   SELLER

Authorized Signature(s)   Authorized Signature(s)

Date : ..... Authorized Signature

Appendix O

Purchase order (example)

Delivery Term: FOB Colombo
Payment Term: LC at sight
Transport Method: Sea
Country of Origin: Sri Lanka
Port of Loading: Colombo - Sri Lanka
Port of Discharge: Rotterdam - Netherlands
Country of Destination: Germany

PO Line	Our Reference Number Article Description	Selling Unit				Total Purchase Order Value			
		Unit of Measure	Quantity	Currency	Buying Price	Buying Value	Bonus and Discount	Additional Charges	Net Invoice Value
1	72-267.855/1/5-002.269.263/090 Ladies Blouse	PCE	270	USD	8.4000	2,268.00	0.00	0.00	2,268.00
2	72-267.855/2/5-002.269.263/090 Ladies Blouse	PCE	612	USD	8.4000	5,140.80	0.00	0.00	5,140.80
3	72-267.855/3/5-002.269.263/090 Ladies Blouse	PCE	360	USD	8.4000	3,024.00	0.00	0.00	3,024.00
	Purchase Order Total:		1,242	USD		10,432.80	0.00	0.00	10,432.80

Order Line	Delivery	QC Inspection Date	ETD	Inspection Type	Quantity	Supplier Article Number	Assortment / 1 Dimension / 2 Dimension
		Promotion	GTIN	Customer Order	Customer Article Number	Strategic Article Number	Logistic EAN Number
1	1	25.09.2012	05.10.2012	MGB Inspection	270	111-F12-11-4815	1 Dimension (Colour)
			363371400				
2	1	25.09.2012	05.10.2012	MCB Inspection	612	111-F12-11-4815	1 Dimension (Colour)
			363371411				
3	1	25.09.2012	05.10.2012	MGB Inspection	360	111-F12-11-4815	1 Dimension (Colour)
			363371422				

The source of data for each article's markings can be found in the article's Marking-Instruction table in this PO. For inner box, please print on two front sides of inner box carton. For export carton shipping markings, please refer to General Packaging Instruction.

Appendix P

Value Addition Related Successful SCM Strategies

PLANNED PRODUCTION ARRANGEMENT (COMPLETE AT "IN PROCESS ONE" ONLY EXCEPT FOR CHANGES TO PLAN):

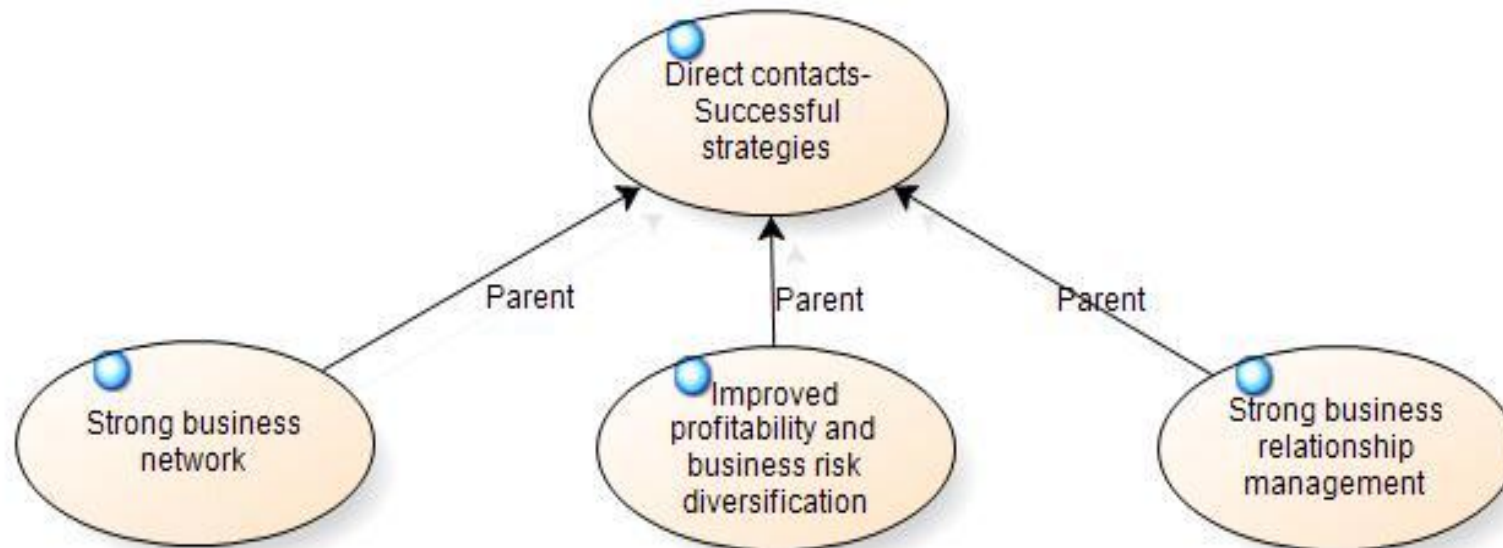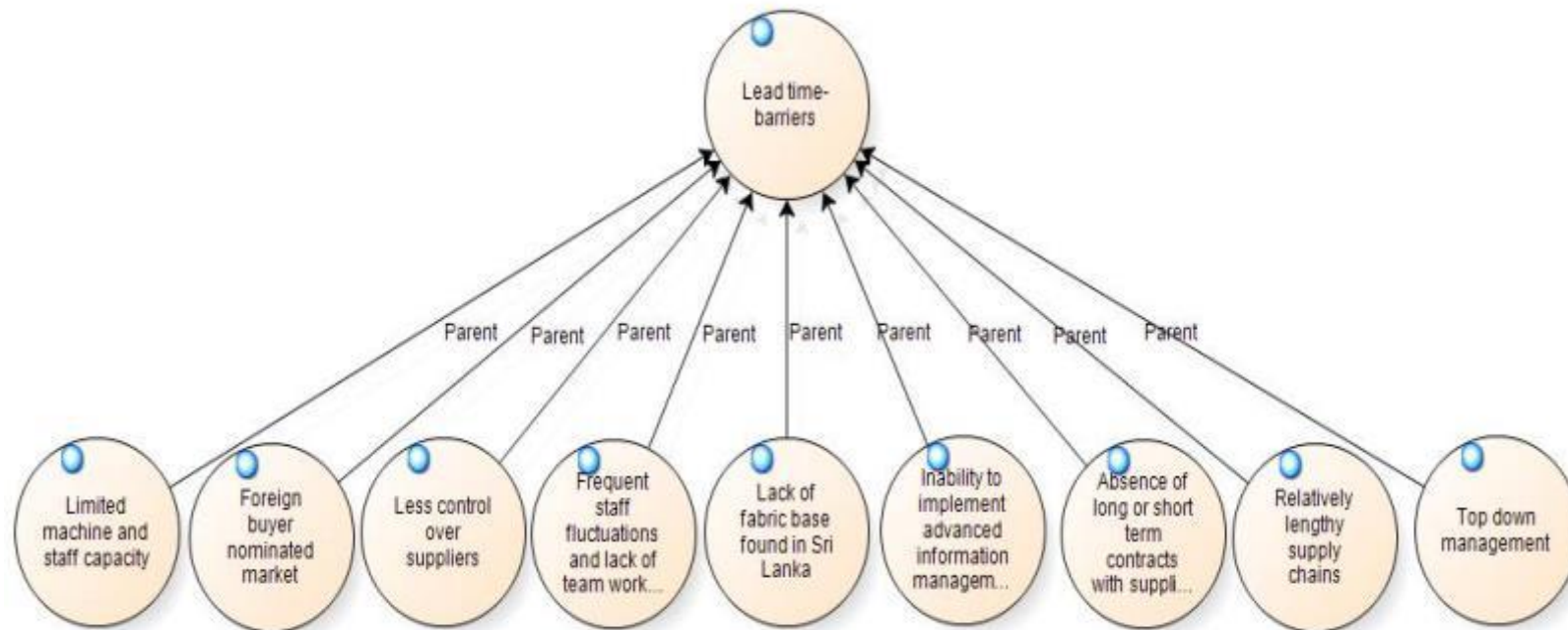|	FACTORY	COUNTRY LOCATION	SAME AS	
FABRIC			☐ YES	☐ NO
CUTTING			☐ YES	☐ NO
MINOR SEWING			☐ YES	☐ NO
MAJOR SEWING/ASSEMBLING		CRL — LANKA	☐ YES	☐ NO
FINISHING			☐ YES	☐ NO

MANUFACTURING PROCESS CONFERRING COUNTRY OF ORIGIN : ☐ FABRIC ☐ CTS PANEL ☐ ASSEMBLY

ACTUAL PRODUCTION STATUS :

	STATUS
CUTTING	
MINOR SEWING	
MAJOR SEWING/ASSEMBLING/LOOPING	✓
FINISHING	
PACKING	

CUTTING	SEWING	FINISHING	SAFETY CHECK
SHADING	THREAD	WASHING	BROKEN NEEDLE LOG
PLY MATCH	SEAM	HANDFEEL	OPERATOR CHECK
STRIPE MATCH	STITCH	CLEANING	NEEDLE DETECTOR CHECK
PATTERN	SHAPE/SYMETR	PRESSING	SNAPPING M/C
MARKER	BUTTON/HOLE	FOLDING	SNAP TEST RECORD
CUT REPORT	LABEL/POSITION	TICKETING	LOCK STITCH BUTTON M/C
OTHERS	BAR TACKING	HANG TAG	SAF-Q
	HEMMING	POLY BAG	NECK STRETCH GAUGE
	LINING	CARTON	OTHERS
	POCKETING	MARKING	
	ZIPPER	PACKING	
	OTHERS	GMT.WT.	

A = ACCEPTABLE /AVAILABLE   U = UNACCEPTABLE / UNAVAILABLE   N/A = NOT APPLICABLE

QUALITY COMMENTS:-				CRIT	MAJ.	MIN
1) collar *poor* s/a found gmt cut at shoulder						
2) arm hole cut b/h found gmt unstrong						
3) arm hole altana c/h found gmt *mishaped*						
4) collar *hem* cut line c/h found gmt *uneven* *mishaped*						
5) colour shading s/a found gmt collar, sw, front back, sw *sleeve*						

INSP. QTY		TOTAL		

I CONFIRM ACCURACY OF ALL INFORMATION ABOVE AND AGREE TO MAKE CORRECTIONS AS PER ABOVE COMMENTS IMMEDIATELY CONFIRMED & SIGNED BY VENDOR/FACTORY REPRESENTATIVE.

SIGNATURE	DATE	AUDITOR INITIALS	Q.A MANAGER INITIALS

NISAAN PRINTERS

Appendix R

Direct Contacts Related Successful Strategies

Appendix S

Lead time related constraints

Appendix T

Key performance indicators

KEY PERFORMANCE INDICATION

APRIL 2011

ABSENTEEISM   LINE : 01 = 13 %

                LINE : 02 = 8.63 %

PRESENT   78.37 %

EFFICIENCY   LINE : 01 = 54.86 %

                LINE : 02 = 44.37 %

DEFECTIVE   LINE : 01 = 1.47 %

                LINE : 02 = 2.68 %

CUT TO SHIP RATIO   99 %

MAN TO MACHINE RATIO   1 : 2.08 %

LABOUR TURN OVER   4.13 %

TOTAL PRODUCTION UNITS   23627 PCS

List of Machinery

MACHINE	QUANTITY
SINGLE NEEDLE	32
OVERLOCK	13
DOUBLE NEEDLE	05
FLAT LOCK	11
BUTTON HOLE	01
BUTTON ATTACHE	01
BAR TACK	01
WAIST BAND	02
BLIND STITCH	01
RIB CUTTING	01
SNAP BUTTON	02
END CUTTING	01
CUTTING MACHINE	03
FUSING MACHINE	01
THREAD RE-WINDING	01
THREAD CLEANING	01
IRONS	03
VACUUM TABLES	04
BOILERS	02
LECTRA CAD	01
AIR COMPRESSOR	01
STANDBY GENERATOR	01

11ᵗʰ November 2011

Appendix V

Organisational chart (example)
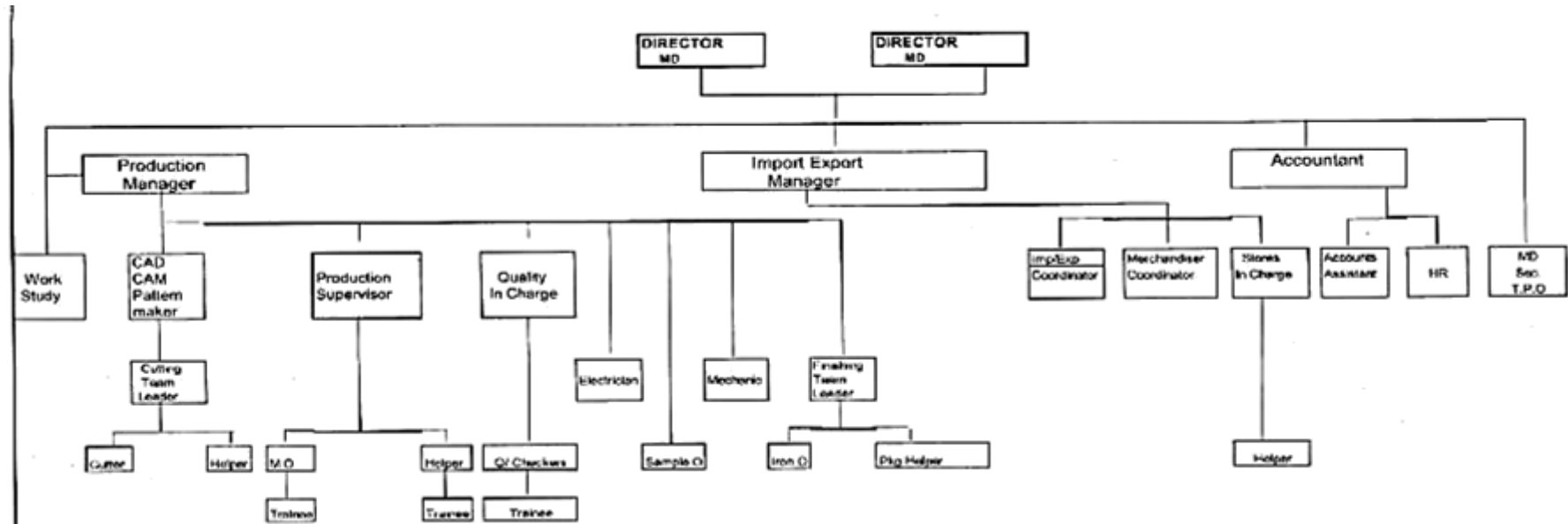
Value addition related constraints
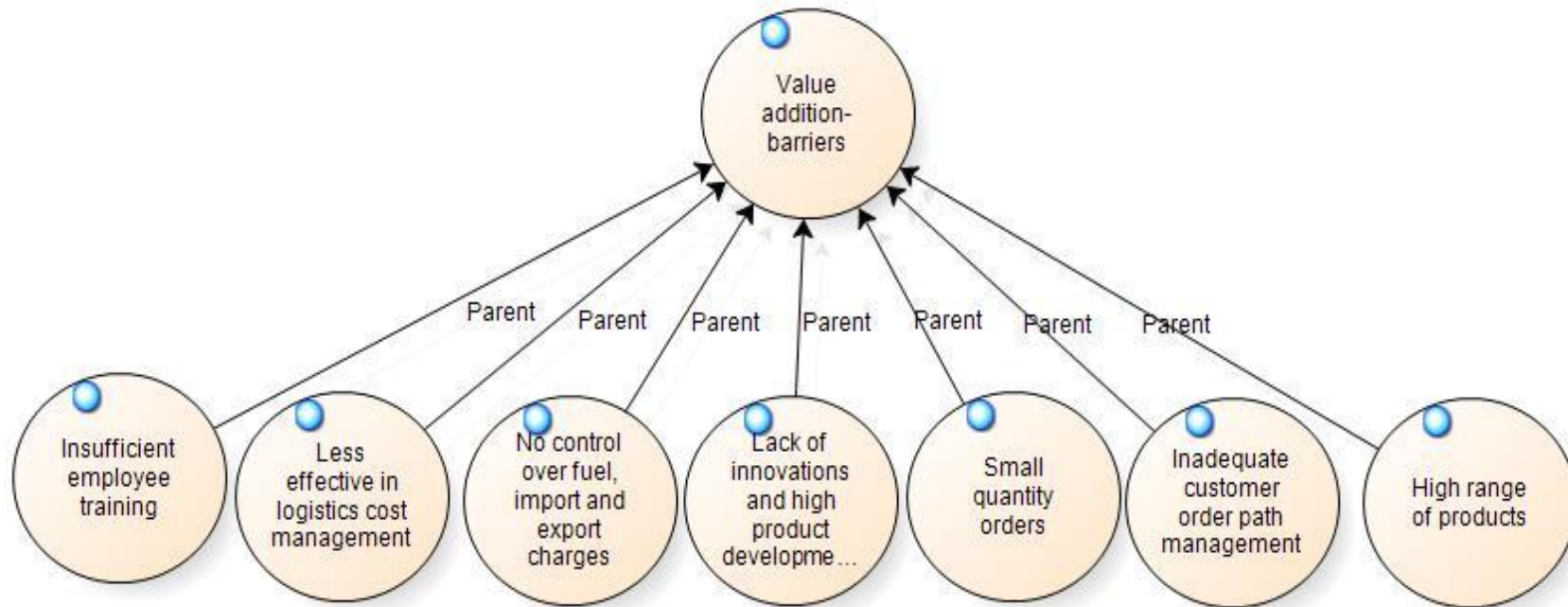
Appendix X

Company profile (example)

DATE OF INCORPORATION:	04TH APRIL 1985	
NATURE OF BUSINESS:	GARMENT MANUFACTURER AND EXPORTER	
BUYERS:	BONMARCHE AND PERFECTION (UK)	
MAIN PRODUCTS:	LADIES PANTS, BLOUSES, SKIRTS, SHORTS	
NO. OF EMPLOYEES:		132
	FACTORY MANAGER	1
	ADMIN	2
	MERCHANDISER	1
	PRODUCTION STAFF	1
	MACHINE OPERATORS	52
	LINE HELPERS	25
	FINAL CHECKERS	5
	CHECKERS	6
	CUTTING HELPERS	6
	IRONERS	10
	PACKING HELPERS	11
	LABOURERS	2
NO.OF MACHINES:	NORMAL	14
	OVERLOCK	26
	KANSAI	
	FLATLOCK	2
	BUTTON HOLE	1
	BARTACK	2
	SNAP BUTTON	2
	BUTTON ATTCHER	2
	BLIND HEM	1
	DOUBLE NEEDLE	2
	IRON TABLE	4
	CUTTING MACHINES	3
	CUTTING TABLE	2
MONTHLY PRODUCTION CAPACITY		50.000 pcs

Appendix Y

Direct contacts related constraints