

Supply Chain Integration from a Resource-based View Perspective

Empirical Evidence from Jordan's Garment Manufacturers
International Supply Chains

Ismail Abushaikha

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School of Management and Languages

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ABSTRACT

Despite the large body of research devoted to the topic of supply chain integration in operations and supply chain management literature, most studies agree that the concept is still undertheorised. There is also a dearth of empirical research on supply chain integration comprising external suppliers and customers and internal company integration, and weaknesses in our understanding of the interrelationships between the levels of supply chain integration. This research addresses these gaps in literature and investigates how supply chain integration might lead to improved competitive advantage.

A theoretical framework was developed from the literature and encompassed three levels of external supplier and customer and internal company integration. This framework is anchored by the resource-based view (RBV) addressing a theoretical gap in the way this theory might be used across the supply chain to enhance competitive advantage. Following a pilot case study, five case studies were conducted in the context of garment manufacturers supply chains. The data collection process adopted a novel methodological approach through obtaining evidence from manufacturers, suppliers and customers across each case study supply chain.

The outcome of the case study research is an empirical model of supply chain integration. The empirical findings suggest that supply chain integration is achieved through integration at the three levels of internal, supplier and customer, and that the benefits reaped from internal company integration is higher in the presence of customer integration. The importance of this finding is that it addresses a frequently asked question in recent literature about the relevance of internal company integration to the successful implementation of supply chain integration. Moreover, this research contributed to supply chain management literature through theoretical and practical application of RBV across geographically dispersed garment manufacturers' supply chains. The empirical findings suggest that garment manufacturers benefited from inbound spillover (unintended) rents through integrating with their international customers.

The findings also suggest that the developed empirical model informs the concept of supply chain visibility; an emerging area of research in recent years. Finally, this thesis provides practical implications and some directions for future research.

DEDICATION

'To my late mother who passed away in the middle of completing this thesis in the summer of 2012 and dedicated her life to see this work finished. Sorry for not being able to fulfill your dream before the moment had come. To your memory I dedicate this work'

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DECLARATION STATEMENT



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GLOSSARY

Buying House: A party responsible for buying garments from manufacturers and export to retailers

C&F: The seller arranges and pays for the main carriage to the named port of destination

CIF: The seller arranges and pays for the main carriage and insurance

Fabric: Cloth produced by weaving or knitting textile fibres

FOB: The seller arranges the goods to the port of origin and the buyer arranges the rest.

Full-package Manufacturing: Refers to a business model in garment industry where the manufacturer is responsible for making the sourcing arrangements, design and all production processes for making a garment ready for sale

Greige: Fabric that is not fully processed

Letter of Credit: A document issued by a bank assuring payment to the supplier provided particular documents have been presented to the bank

Nominated Supplier: A supplier that has been arranged by the customer

NVivo: qualitative data analysis software used for organising, codifying and analysing data.

Pre-production Meeting: A cross-functional meeting conducted prior to producing an order

Qualifying Industrial Zones (QIZs): Industrial parks located in several places across Jordan from which manufacturers export garments duty-quota-free

Stock-keeping-unit (SKU): An individual item that differs from other items in some way

Technical Package (specification package): A document contains detailed information about designing, manufacturing and despatching a garment

Trim Card: A card that contains the trim specifications

Trim: Materials used for enhancing garments such as button and tape

ABBREVIATIONS

C&F: Cost and Freight

CIF: Cost, Insurance and Freight

CPS: Collaborative Planning System

CSCMP: Council of Supply Chain Management Professionals

EDI: Electronic Data Interchange

ERBV: Extended Resource-based View

ERP: Enterprise Resource Planning

FG: Finished Goods

FOB: Free-on-board

FTA: Free-trade Agreement

IT: Information Technology

MTO: Make-to-order

MTS: Make-to-stock

QIZ: Qualifying Industrial Zones

RBV: Resource-based View

RM: Raw Materials

SCM: Supply Chain Management

SKU: Stock-keeping Unit

SOP: Standard Operating Procedure

TCE: Transaction-cost Economics

VMI: Vendor Managed Inventory

VRIN: Valuable, Rare, Inimitable and Non-substitutable

WIP: Work-in-progress

1. Introduction

This chapter provides a background for the research. It discusses the motivation for the research together with the gap in theoretical knowledge that informs the research aim and objectives and the research scope. The chapter also outlines the potential contribution of the research, providing an overview of the significance of the research and expected results. Finally, this chapter provides an overview of the thesis structure.

1.1 Motivation for the Research

The main motivation for conducting this study initiated from the challenges the researcher encountered while working within a supply chain consultancy team identifying improvement opportunities in the export performance of Jordan's garment manufacturers. Despite the importance of the garment manufacturing sector to the Jordanian economy, there was a lack of understanding in the industry of the requirements needed to become internationally competitive. Hence, there was a need to study the garment manufacturing sector in a global context.

Jordan is located at the crossroads of three continents (Asia, Africa and Europe) and the trading routes between the Far East and Europe. The country has the largest number of trade agreements with the Western World amongst the Arab Countries and is enjoying political stability in a region, the Middle East, which is known for instability. Moreover, since 2001 the manufacturing sector has considerably benefited from the establishment of Qualifying Industrial Zones (QIZs). The country has long focused on competing through manufacturing aiming at benefiting from the abovementioned characteristics. The Garment Manufacturing Industry in Jordan is the largest export industry in the economy making up 20.5 per cent of the total national export of Jordanian merchandise in 2012 (Central Bank of Jordan, 2014). The fact that Jordan has limited natural resources has forced manufacturers to import raw materials including fabric and trim from several countries, mainly from China but also Egypt, Pakistan and the European Union. This means higher complexities in the supply chain with manufacturers finding it difficult to respond to short-term orders. One of the most difficult challenges the garment manufacturers currently encounter is how to integrate the numerous different parties involved in the production planning phase (Wang and Chan, 2010). In particular, there is a difficulty in integrating the upstream and downstream functions (Towers and Burnes, 2008) in geographically dispersed supply chains (Wang and Chan, 2010;

Caniato *et al.*, 2012). Thus, this research will make use of supply chain integration literature to support the garment industry in Jordan. Until now, there have been no empirical studies from a research context investigating the role of the supply chain in Jordan as it relates to the garment manufacturing industry and very few studies conducted on the manufacturing sector. Moreover, supply chain is still an immature area of research in Jordan. Thus, the main motivation lies in the researcher's genuine desire to make a contribution to the growth of the garment manufacturing industry in Jordan.

1.2 Gap in Theoretical Knowledge

Despite the large body of research in operations and supply chain management literature on relationship governance, most studies agree that the theory of supply chain integration is still underdeveloped and there is a clear lack of agreement on its constructs (Flynn *et al.*, 2010; Zhao *et al.*, 2011; Schoenherr and Swink, 2012; Gimenez *et al.*, 2012). Therefore, previous empirical findings have been inconsistent. Thus, the importance of precisely defining the concept of supply chain integration and its constructs has been suggested by recent studies (Schoenherr and Swink, 2012; Turkulainen and Ketokivi, 2012). The literature review in this thesis suggests that previous findings have been affected by several factors including levels of integration, components of integration, the theoretical foundation, the product and national context of the study and the validation of data sources across the supply chain. The literature review also suggests that there is no framework for understanding supply chain integration of manufacturers' internal functional departments, their suppliers and customers. Moreover, there is a gap in our understanding as to the interrelationships between levels of integration and limited empirical evidence on the importance of internal company integration for achieving successful supply chain integration.

The weaknesses and contradictions in our understanding of supply chain integration together with the thesis motivation determined the following research aim and objectives.

1.3 Research Aim and Objectives

The overall aim of this thesis is to investigate the role of supply chain integration between garment manufacturers, suppliers and customers in striving for competitive advantage. To fulfil the research aim, there are the following objectives:

1. To develop a theoretical framework for integrating manufacturers' internal functional departments with their external supply chain suppliers and customers;
2. To empirically investigate how the levels of supply chain integration are interrelated;
3. To validate the theoretical framework in order to understand competitive advantage for garment manufacturers and their international suppliers and customers.

1.4 Research Contribution

The potential contribution of this research can be divided into theoretical, methodological and practical contributions.

1.4.1 The Potential Theoretical Contribution

The potential theoretical contribution of this research can be summarised as follows:

- This research is expected to provide a greater theoretical understanding of supply chain integration comprising external supplier and customer and internal company integration.
- This research addresses a frequently asked question in recent literature about the interrelationships between the levels of supply chain integration.
- This is the first empirical research applying resource-based view (RBV) theory for investigating supply chain integration comprising suppliers, customers and internal company integration. The research introduces multiple case studies that are rich in description for understanding RBV in the context of supply chain management. Thus, this research fills a gap in our understanding of the way internal, upstream and downstream resources fit and interact with each other to generate even further resources and improve competitive advantage from the RBV perspective.
- This research provides a perspective on supply chain integration and RBV application in supply chain management from a developing country such as Jordan (Flynn *et al.*, 2010; Liu *et al.*, 2010).
- This research provides insights on the emerging topic of supply chain visibility based on the empirical case study research.

1.4.2 The Potential Methodological and Philosophical Contribution

This research is proposed as making methodological and philosophical contributions as it:

- Adopts a novel methodological approach in studying supply chain integration through obtaining data from manufacturers, suppliers and customers across each case study supply chain.
- Adopts and provides insights on an alternative approach to conducting phenomenological research in the field of supply chain management.

1.4.3 The Potential Practical Contribution

This research is proposed as making contribution to practice as it:

- Develops an empirical supply chain integration model for improving the competitive advantage of garment manufacturers serving international customers.
- Provides suggestions on maximising manufacturers limited resources through understanding how to manage their integration efforts and increase the internalisation of external resources.
- Provides an understanding of supply chain integration in the garment manufacturing industry (Rosenzweig *et al.*, 2003; Gimenez *et al.*, 2012).
- Provides recommendations for Jordan's garment industry as it strives to become internationally competitive. It also provides suggestions for future researchers interested in supporting the garment sector in the country and other nations who might have similar characteristics such as Egypt, Morocco and Tunisia.

1.5 Research Scope

This research focuses on the phenomenon of supply chain integration comprising external supplier integration, external customer integration and internal company integration. As supply chain integration is related to other concepts within the field of operations and supply chain management such as logistics and relationship governance, these concepts are specified but their use is limited to clarifying issues concerning supply chain integration. However, the empirical findings suggest that the new emerging concept of supply chain visibility is closely related to supply chain integration and as such its relevance is highlighted in this research.

The basis of this research is to gain a greater understanding of supply chain integration from a developing country perspective through introducing a qualitative empirical investigation across Jordan's garment manufacturers international supply chains. Therefore, where a reference is made to focal companies, these are Jordanian garment manufacturers. Hence, the most obvious limitation of this research is the concern with generalising the findings from inductive case studies to a wider business community or other nations.

1.6 Thesis Structure

The thesis consists of 8 chapters organised as follows. The first chapter provides a background for the research. It presents the research motivation, gap in theoretical knowledge, aim and objectives and the potential contribution.

Chapter 2 reviews transaction-cost economics (TCE) and the resource-based view (RBV) as the main theoretical paradigms in supply chain management. These two theories explain how firms implement outsourcing strategies and work within supply chains. This chapter clarifies that the RBV will be used as the main lens of this research.

Chapter 3 begins by explaining the basic concepts of supply chain relationships and coordination which are used as the basis for understanding the concept of supply chain integration. Consequently, the chapter discusses supply chain integration and its role in accumulating internal resources but also external resources across the firm's boundaries from suppliers and customers. It discusses the main issues associated with supply chain integration in the literature. The chapter addresses the gaps that emerged from the review of the supply chain integration literature. This chapter develops a theoretical supply chain integration framework that is grounded in the RBV and comprises internal company integration, external supplier and customer integration.

Chapter 4 presents the research philosophy and methodology. The social constructivist orientation is justified as the appropriate philosophical stance for inquiring into supply chain integration in the context of Jordanian garment manufacturers. The rationale for conducting qualitative methods based on multiple-case study research is also explained. This chapter provides details on the data collection process, data reduction and analysis. The chapter also provides an overview of the pilot study presented in Appendix B.

Chapter 5 presents a case-by-case analysis and is divided into five major sections addressing each of the five case studies. Each section starts by describing the context of the case study to be analysed. Each case study consisted of a garment manufacturer being the focal company and at least one supplier and one customer. The chapter also discusses each of the five case studies based on the theoretical framework constructs. Data collected from each case study is presented and analysed separately in this chapter in order to allow the unique patterns of each case to emerge before conducting the cross-case analysis.

Chapter 6 is a cross-case analysis. It introduces the key themes identified in the five case studies in the previous chapter. The theoretical supply chain integration framework major constructs are used to categorise the data. The results of the analysis were interpreted drawing on the RBV theoretical rationale.

Chapter 7 frames the case study analysis in the context of previous supply chain integration literature. The RBV will be used in this chapter to interpret the empirical findings. The purpose is to develop an empirical supply chain integration model that underpins competitive advantage for garment manufacturers serving international customers.

Chapter 8 addresses the research objectives and summarises the contribution of this thesis to knowledge. Based on the empirical findings this thesis introduces also recommendations for garment manufacturers and decision makers in Jordan. The final part of this thesis introduces the research limitations and directions for future research. Figure 1.1 below provides an overview of the 8 chapters of the thesis.

Chapter 1 (Introduction) Presents the context of research and outlines the research objectives		Introduction
Chapter 2 (Underpinning Theories and Supply Chain Management) Reviews the main theoretical paradigms and introduces the basic concepts of supply chain management	Chapter 3 (Supply Chain Integration and the Theoretical Framework) Discusses the concept of supply chain integration and develops a novel theoretical framework.	Literature Review
Chapter 4 (Research Philosophy and Methodology) Adopts a philosophical stance and presents the research design. It also discusses the pilot study enclosed in the appendices.		Empirical Part
Chapter 5 (Case-by-case Analysis) Presents and discusses each of the five case studies individually with descriptive write-ups	Chapter 6 (Cross-case Analysis) Develops themes through comparing and contrasting the case studies	Empirical Part
Chapter 7 (Discussion and the Developed Empirical Model) Discusses the empirical findings from the case study analysis in the context of extant literature and develops a novel empirical model	Chapter 8 (Conclusions) Addresses the research objectives and introduces theoretical and practical implications	Conclusions

Figure 1.1: Thesis structure

2. Theoretical Underpinning and Supply Chain Management

This chapter provides a theoretical understanding of supply chain management. It covers the main theoretical underpinning for supply chain management of Transaction-Cost Economics (TCE) from microeconomics and the Resource-based View (RBV) from strategic management. Supply chain management researchers have long emphasised the importance of applying theories from other disciplines (Rungtusanatham *et al.*, 2003; Harland *et al.*, 2006) in order to provide innovative insights (Grover and Malhotra, 2003; Barratt *et al.*, 2011) into this emerging field of study (Harland *et al.*, 2006). Following a detailed review of the TCE and RBV, these two theoretical perspectives were used to explain the outsourcing decision and underpin defining supply chain management. The RBV will be also used to provide a theoretical grounding to supply chain integration in the next chapter and interpret the empirical findings from this research. Therefore, the RBV is considered the main lens in this research and TCE is used only in this chapter. The importance of linking the firm's internal operations but also the firm and its suppliers and customers is established in this chapter to support the argument for supply chain integration which will be discussed in detail in Chapter 3. Figure 2.1 below shows the structure of this chapter and the second chapter of the literature review.

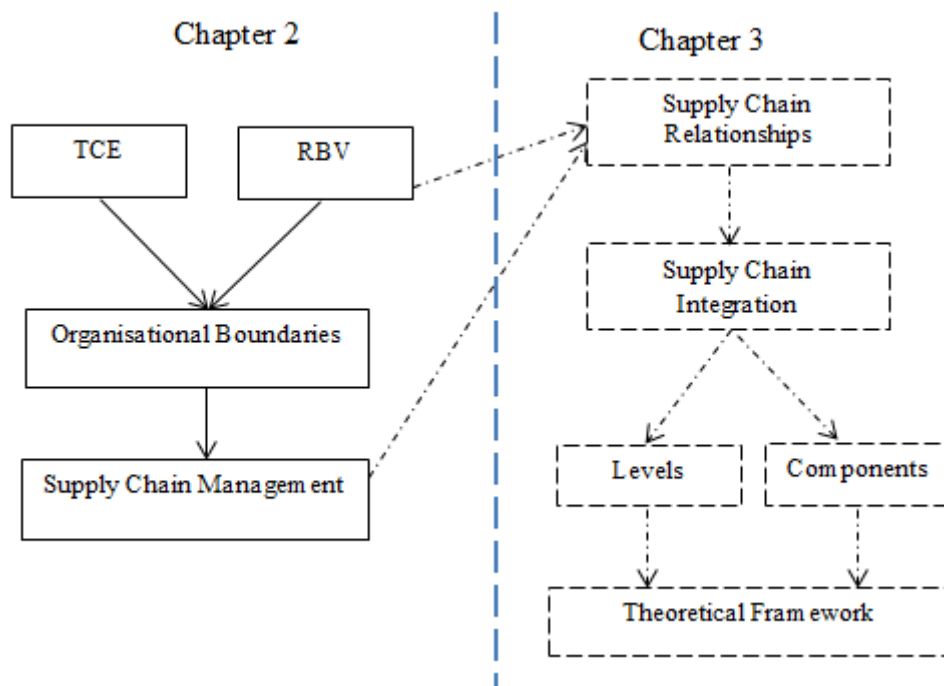


Figure 2.1: A simplified structure of the literature review (Chapter 2)

2.1 Transaction-Cost Economics

The concept of transaction-cost first appeared in Coase (1937) who created the basis of what became transaction-cost economics (TCE) theory. However, the concept was not elaborated until Williamson (1975 and 1979) who used the term 'transaction-cost economics' (TCE). The idea of TCE is to reduce the total costs associated with performing transactions through choosing the most economical governance structure; hierarchy or market (Williamson, 1979). Governance in this context can be described as "a mode of organising transactions" (Heide, 1994, p71). Hierarchical governance refers to performing a transaction within the firm. In contrast, market governance is when a transaction is performed through traditional market mechanisms of supply and demand (Geyskens *et al.*, 2006).

The decision whether to perform a transaction internally or externally depends on the difficulties and costs associated with the transaction. Transaction difficulties refer to factors arising because of contractual hazards under uncertainty including bounded rationality, opportunism, small numbers bargaining and information impactedness (Reve, 1990; McIvor, 2000). Bounded rationality refers to the limited ability of human mind to recognise future complexities. In the organisational context, decision makers are limited in their ability to take rational decisions especially under conditions of uncertainty (Grover and Malhotra, 2003). Opportunism refers to decision makers acting with guile, as well as out of self-interest (Williamson, 1979). Behaviours such as cheating, lying and violating agreements are examples of opportunism which may lead to increase transaction costs in the form of monitoring and safeguarding specific-assets against such possible behaviours (Grover and Malhotra, 2003). Small numbers bargaining refers to the availability of alternative sources of supply to meet the supplier's requirements. Information impactedness refers to "the presence of information asymmetries between the buyer and supplier, which means that either party may have more knowledge than the other" (McIvor, 2000, p23). As for the costs of performing a transaction, this can be viewed in terms of negotiation, control, communication and writing a contract (Das and Teng, 2000). There are three characteristics of a transaction, defined by Williamson (1979), under which carrying out a transaction becomes even more costly. The high costs associated with these characteristics make the hierarchical governance more efficient than market governance (Geyskens *et al.*, 2006). These characteristics are asset specificity, uncertainty and transaction frequency.

2.1.1 Asset Specificity

Asset specificity is the most important factor of transactions in deciding the most economical governance structure for the firm; market or hierarchy (Williamson, 1985; Geyskens *et al.*, 2006; De Vita *et al.*, 2011). Williamson (1985, p95) defined asset specificity as the “the degree to which an asset can be redeployed to alternative use by alternative users without sacrifice of productive value”. Asset specificity or relationship-specific investment was also defined in terms of the uniqueness of assets to certain activities (De Vita *et al.*, 2011; Caldwell and Howard, 2014). Asset specificity is categorised into three degrees: non-specific (highly standardised), idiosyncratic (highly customised) or a mix of both previous types (Grover and Malhotra, 2003). Williamson (1997) defined four types of asset specificity; human asset specificity, physical asset specificity, site specificity and dedicated specificity.

- **Human asset specificity** refers to “the degree to which skills, knowledge and experience of a firm’s personnel are specific to the requirements of dealing with another firm” (De Vita *et al.*, 2011, p6). Such skills are not readily transferable as they evolve from learning-by-doing (De Vita *et al.*, 2011) and are customised to execution in the environment where they evolved (Grover and Malhotra, 2003). Examples of this type can be seen in training of sales and marketing staff (Cousins, 2005).
- **Physical asset specificity** refers to the customisation of specific assets to a specific transaction. The uniqueness of physical specific assets makes them difficult to be redeployed and used by other transactions. Therefore, they have little or no value for other transactions (Cousins, 2005; De Vita *et al.*, 2011). Examples of this type can be seen in investments in specific machinery or tools (Cousins, 2005; Caldwell and Howard, 2014).
- **Site asset specificity**: An example of site specificity is the situation when the supplier and the buyer invest in a facility such as a plant or a warehouse near by major operations (Cousins, 2005) to benefit from reducing inventory, transports costs, and other transactional costs. This investment in a specific site is expected to result in long supply relations. However, the relocation cost of such investment is very high therefore they are characterised by high immobility (De Vita *et al.*, 2011).
- **Dedicated asset specificity** refers to the investment in assets for general use with the expectation of meeting the requirements of a specific contract. This is

different from the physical asset specificity in that it does not include investment in customised assets. Such investments will result in a long-term relationship between the two parties. However, if the relationship finishes earlier than expected, this might lead to a financial disruption (De Vita *et al.*, 2011).

2.1.2 Uncertainty

Uncertainty arises basically from two major sources being environmental uncertainty and behavioural uncertainty. Environmental uncertainty refers to the problems that arise due to difficulties in the anticipation of future changes (Rindfleisch and Heide, 1997; Cousins, 2005; Wong *et al.*, 2011) which makes it difficult to specify the contract *ex ante* (Geyskens *et al.*, 2006). Such uncertainty leads to additional transactional costs arising from rewriting and renegotiation a contract (Williamson, 1979). The environmental uncertainty can be viewed in terms of technological uncertainty and volume uncertainty. Technological uncertainty arises when there is difficulty predicting the technological requirements in a relationship such as changes in the specifications of components or products or technological development (Geyskens *et al.*, 2006). Volume uncertainty refers to the difficulty in forecasting the exact volume of demand for a transaction. This would result in the buyer bearing unnecessary costs of either holding excess inventory or stock-out and the supplier experiencing sudden production or excess capacity (Geyskens *et al.*, 2006). Behavioural uncertainty refers to the difficulty associated with evaluating a transaction performance or what is termed as *ex post* (Rindfleisch and Heide, 1997; Geyskens *et al.*, 2006).

2.1.3 Transaction Frequency

The third dimension of characterising a transaction is frequency. This refers to the degree of buyer activity in the market (Williamson, 1979) or the degree to which a transaction occurs (Geyskens *et al.*, 2006). The argument is that transactions with high frequency need to be performed internally under a hierarchical governance structure to reduce the costs associated with the large number of transactions (Williamson 1985; Geyskens *et al.*, 2006).

In summary, TCE is theory essential to understanding the organisational governance structure; market and hierarchy. The decision whether to perform a transaction internally or externally depends on the difficulties and costs associated with the

transaction. Whereas market structure is recommended for transactions with low costs, the hierarchical structure is suggested when the cost of carrying a transaction is high.

The next section will review the resource-based view (RBV) as another theory essential to explaining organisational competitiveness, deciding the firm's boundaries and developing competitive advantage through accessing other firms' resources.

2.2 The Resource-Based View

The origin of the Resource-Based View (RBV) can be traced back to the seminal work of Penrose (1959) of 'the theory of the growth of the firm'. Penrose viewed the firm as a set of unique internal resources through which firms are differentiated from each other and are able to excel. Rubin (1973) supported Penrose's view in that the firm consists of a bundle of resources. Wernerfelt (1984) was the first to introduce a complete work on the RBV in which he also supported the view of Penrose that the firm consists of a bundle of unique resources. Nevertheless, the RBV was not popular until the early 1990s as several scholarly works were introduced intensively such as those of Prahalad and Hamel (1990), Barney (1991), Grant (1991), Rumelt (1991), Hamel and Prahalad (1994) and Collis and Montgomery (1995).

2.2.1 The Logic of the Resource-Based View

The emergence of the RBV theory represents a disagreement with the five forces analysis model or what is known as Porter's Theory (Dyer and Singh, 1998). The RBV theorists argue that firms consist of a collection of heterogeneous resources and that these resources are the source of competitive advantage (Barney, 1991; Peteraf, 1993). In other words, generating a competitive advantage depends on what unique internal resources a firm possesses. These resources can be tangible or intangible. On the other hand, Porter's Theory, the earlier view of the firm within strategic management, assumes the homogeneity of firms and suggests that the competitive advantage of the firm evolves from the industry in which a company exists (Porter, 1980; Dyer and Singh, 1998). Therefore, generating a competitive advantage, according to Porter's Theory, depends on the position of the market and products, rather than the internal resources possessed by the firm. Hence, RBV represents an important departure from this view. RBV suggests that firms are composed of heterogeneous resources which contribute to differentiate firms from each other.

2.2.2 Firm's Resources

Rubin (1973, p973) referred to a firm's resource as "a fixed input which enables a firm to perform a particular task. The input is made up of people and the real assets that they use". Wernerfelt (1984, p172) described a firm's resource as "anything which could be thought of as strength or weakness...examples of resources are: brand names, in-house knowledge of technology, employment of skilled personnel, trade contacts, machinery, efficient procedures, capital, etc.". Firm resources may include, but not limited to, capital equipment, employee skills, patents, brand names, and finance (Grant, 1991). Amit and Schoemaker (1993, p35) referred to the firm's resources as "stocks of available factors that are owned or controlled by the firm". Espino-Rodriguez and Padron-Robaina (2006) viewed firms resources in terms of assets specificity discussed earlier. Barney (1991, p101) defined firm resources as "all assets, capabilities, organisational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness". Barney (1991) classified the firm resources into three categories:

- **Physical capital resources:** are what the firm possesses and use of physical technologies, production facilities, equipment as well as its geographical location and accessibility to raw materials.
- **Human capital resources:** include intangible resources such as training, people experiences, judgment, intelligence, relationships, and insight of the firm's managers and workers.
- **Organisational capital resources:** are the nature of the formal structure in the firm, the firm formal and informal planning, controlling, and coordinating systems and informal relations amongst groups of employees within a firm and between a firm and those in its environment.

The discussion above explains that the firm's resources, as classified by Wernerfelt (1984), can be tangible or intangible. These resources are embedded in a firm's assets and personnel. The uniqueness of a firm's internal resources is the attribute that makes a company outperform another in a specific industry. The uniqueness of a firm's resources that help outperforming other firms is referred to in strategic management literature as competitive advantage. The next section will introduce the concept of competitive advantage and discuss its most popular models in literature.

2.3 Competitive Advantage

Despite the debate in strategic management represented by the RBV and Porter's Theory about the sources of firms' competitiveness, both views agree that it is generating a 'competitive advantage' that makes a firm outperform another (Porter, 1980; Barney, 1991). Hence, it is essential at this stage to clarify what is meant by a competitive advantage as a key concept in this area. Barney (1991, p102) defined a competitive advantage and usefully distinguishes it from a sustained competitive advantage. "A firm is said to have a *competitive advantage* when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors. A firm is said to have a *sustained competitive advantage* when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors *and* when these other firms are unable to duplicate the benefits of this strategy". Hence, a competitive advantage emerges from exploiting the unique characteristics or resources of the firm to come up with a value that no other firm (or few other firms) in the same industry possesses. If this value can be protected over a long period of time, then it becomes sustainable.

2.3.1 Competitive Advantage and the Resource-based View

A number of resource-based models have been introduced by the RBV scholars to clarify the characteristics that a resource must have in order to operate a competitive advantage (e.g. Barney, 1991; Grant, 1991; Peteraf, 1993). Grant (1991) suggested four attributes of resources and capabilities which are regarded to be the key determinants of the sustainability of competitive advantage. These characteristics include durability, transparency, transferability and replicability. Durability represents the rate at which the competitive advantage generated from the firm's resources depreciates. Transparency refers to the extent to which a firm can protect its competitive advantage from being imitated. Transferability refers to the degree of mobility of resources to competitors who may implement the same strategies. Replicability refers to the extent to which the firm's resources underlying competitive advantage can be replicated by rival firms. Peteraf (1993) proposed a resource-based model of four conditions which must be met in order for a resource to hold the potential of achieving a competitive advantage as shown in Figure 2.2. These conditions which she referred to as 'cornerstones of competitive advantage' include resource heterogeneity, *ex-post* limit to competition,

imperfect mobility and *ex-ante* limit to competition. Resources' heterogeneity and imperfect mobility are discussed in Barney's model later in this section.

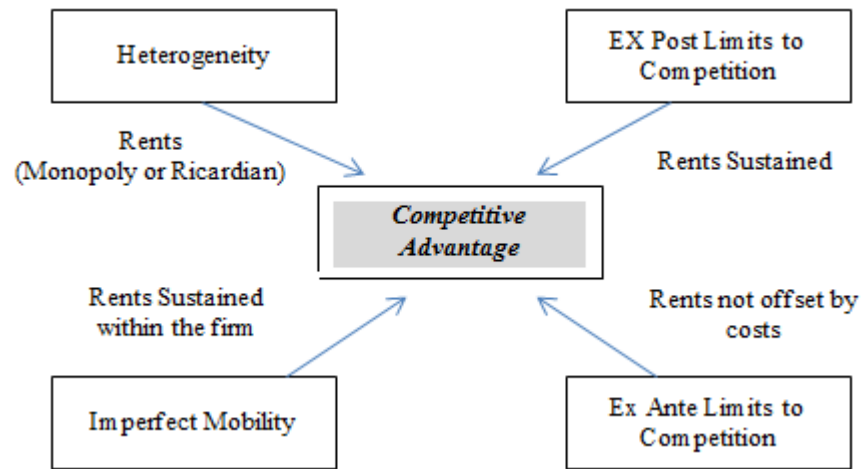


Figure 2.2: The cornerstones of competitive advantage (Peteraf, 1993, p186)

An *ex-post* limit to competition is explained by Peteraf (1993): “subsequent to a firm’s gaining a superior position and earning rents, there must be forces which limit competition for those rents”. By the term rents is meant earnings in excess of breakeven if their existence does not cause new competition (Peteraf, 1993). However, *ex-post* limit to competition is equivalent to imperfect imitability and non-substitutability of resources (Peteraf, 1993) discussed below. The meaning of *ex-ante* limits to competition is that before a firm establishes a superior position or achieves above normal returns, there must be restricted competition for that position. *Ex-ante* limits to competition “keep costs from offsetting the rents” (Peteraf, 1992, p185).

The most popular competitive advantage model in literature is that of Barney (1991) who examined the relation between firm resources and sustained competitive advantage. Given that resources are internal to firms, Barney argued that these resources are different in their importance and cannot be exploited to achieve a sustained competitive advantage unless they meet four characteristics namely, valuable, rare, imperfectly imitable and non-substitutable (VRIN). These key characteristics are discussed in detail.

- **Valuable Resources**

In order for a firm to have a competitive advantage, it must have valuable resources that are not possessed by a large number of firms (Barney, 1991). Firm resources are regarded to be valuable when they enable a firm to develop strategies that improve its

performance (Barney, 1991). This can be achieved through improving the efficiency of effectiveness of the firm (Barratt and Oke, 2007).

- **Rare Resources**

If valuable resources are available to a large number of competitors or potential competitors, then these competing firms will be able to exploit these resources and implement a similar strategy that generates no competitive advantage to a single firm. Priem and Butler (2001, p29) argued that it is not the rareness of resources that produces a competitive advantage, rather; “it is the relative difference in the amount of value generated by firms that is elemental to competitive advantage...if a firm consistently generates value greater than that generated by other firms in its industry, it must have at least one rare-resource. If a firm has rare resources, however, it does not follow that it will generate value greater than that of other firms in its industry”. This means that when a resource generates great value, this resource is rare and valuable.

- **Imperfectly Imitable**

A firm’s valuable and rare resources can only generate a sustained competitive advantage if other firms that do not have these resources cannot acquire them. Therefore, these resources must not be transferable to competing firms (Barney, 1991). A firm resource is imperfectly imitable when one or a combination of three characteristics exists. These are history dependence, causal ambiguity and social complexity. History dependence refers to the valuable and rare resources obtained by a firm because of its unique history. Such firms will be able to create and implement strategies that are not completely imitable by other firms. Unique physical capital resources, brand-names, and culture are all examples of imperfectly imitable resources that generate a competitive advantage because of their unique path through history. Causal ambiguity exists when the link between a firm’s resources and its sustained competitive advantage is poorly understood. Hence, there will be a difficulty to imitate a successful firm’s strategies by others. Social complexity develops when the resources that create a competitive advantage that are based in a complex social phenomenon which makes it difficult for other firms to duplicate these resources. It is the way a resource fits and interacts with other firm resources that increases social complexity and, as a result, reduces imitability and prevents mobility (Rungtusanatham *et al.*, 2003). Examples of social complexity can be seen in interpersonal skills, relationships and culture (Barney, 1991).

- **Non-substitutable Resources**

The last characteristic that a firm resource must have in order to generate a sustained competitive advantage is that “there must be no strategically equivalent valuable resources that are themselves either not rare or imitable” (Barney, 1991, p111). Resources are strategically equivalent when other current or potential competitors are able to use alternative resources to implement the same strategies and produce a competitive advantage (Barney, 1991).

2.3.2 Resource Attributes: Resource Heterogeneity and Immobility

The RBV adopts two assumptions in analysing a competitive advantage. First, firms are heterogeneous in terms of resources they control. Second, resources are not perfectly mobile across firms (Barney, 1991). These two assumptions are explained in detail.

- **Resource Heterogeneity**

There has been an intensive discussion in strategic management literature about the homogeneity and heterogeneity of firm resources (e.g. Porter, 1980; Barney, 1991; Peteraf, 1993). The first stream of literature, led by Porter (1980), claims the homogeneity of firm resources. The other stream of literature led by the RBV theorists argues that firms’ resources are heterogeneous and it is the heterogeneity of firms’ resources that generates competitive advantage of a firm over another. In her model of cornerstones of competitive advantage, Peteraf (1993, p180) argued that “heterogeneity implies that firms of varying capabilities are able to compete in the market-place and at least, breakeven”. Otherwise, if all resources were homogeneous then no single firm will be able to generate a competitive advantage as all competing firms will be able to conceive and implement the same strategies and improve their efficiency and effectiveness in the same way and by the same degree (Barney, 1991). Hence, RBV views firms as a collection of heterogeneous resources which contribute to differentiating them from each other.

- **Resource Immobility**

Firms’ resources are said to be perfectly immobile if they cannot be traded or are less valuable to other users (Dierickx and Cool, 1989; Peteraf, 1993). The reason why these resources are immobile is because they are either tailored to firm-specific needs,

customised to a specific-transaction or relationship, or because of their high transactions costs associated with their transfer (Williamson, 1975; Williamson, 1979; Peteraf, 1993). Imperfect mobility or imperfect transferability (Grant, 1991) is equivalent to what Williamson (1979) referred to as ‘idiosyncratic’ resources that have no alternative use outside the firm (Peteraf, 1993). However, if resources are perfectly mobile, this will allow competing firms to conceive and implement the same strategies as each other. Thus, these strategies cannot be a source of sustained competitive advantage (Barney, 1991).

Barney (1991) developed a framework, shown in Figure 2.3, which describes the relationship between the two underlying assumptions of the RBV; i.e. resource heterogeneity and immobility, and the competitive advantage determinants of a resource together with sustained competitive advantage. This framework has inspired many subsequent scholars based on either using the same framework or introducing an extension (Priem and Butler, 2001).

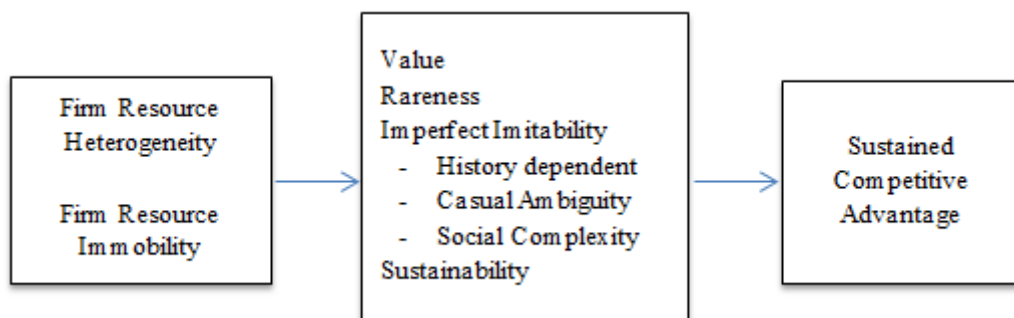


Figure 2.3: The relationship between resource heterogeneity and immobility, value, rareness, imperfect imitability, and substitutability and sustained competitive advantage (Barney, 1991, p112).

Firms can also generate a competitive advantage through developing capabilities (Bharadwaj, 2000) by collecting, integrating and deploying valuable resources that work together (Amit and Schoemaker, 1993). These are viewed in terms of core competence discussed below.

2.3.3 Core Competence

An important concept that has evolved from the RBV is ‘core competence’. A frequently quoted definition of core competences in literature is provided by Prahalad and Hamel (1990, p82) as “the collective learning in the organisation, especially how to

coordinate diverse production skills and integrate multiple streams of technologies”. Quinn and Hilmer (1994) regarded core competence as skills or knowledge sets rather than products or functions. Teece *et al.* (1997, p516) described competences: “when firm-specific assets are assembled in integrated clusters spanning individuals and groups so that they enable distinctive activities to be performed, these activities constitute organisational routines and processes. Examples include quality, miniaturisation and systems integration.” Hamel and Prahalad (1994) considered core competences as an integrated set of skills and technologies that deliver value for the customer. The relationship between the core competence and asset specificity is that they revolve around the core skills that a firm possesses and through which it can compete and sustain its position in the marketplace. These core competences of the firm are always characterised by high asset specificity (Reve, 1990). These are discussed in the context of supply chain management later in this chapter.

In summary, RBV theory suggests that the firm consists of a set of distinct tangible and intangible resources. In order for a resource to generate a sustainable competitive advantage it needs to be valuable, rare, imperfectly imitable and non-substitutable (VRIN).

Having reviewed TCE and RBV and explained their key principles, the next section will discuss how these two theories are used to explain organisational boundaries which, in turn, will form the basis for defining supply chain management.

2.4 Organisational Boundaries

Firms have long strived to relentlessly restructure their operations to improve operational effectiveness and provide goods and services to customers (Pagell, 2004; Koufteros *et al.*, 2010). The focus has traditionally been on optimising internal operations through improving the smoothness of the internal flows of material and information amongst the production and supporting functions (Harland, 1996; Koufteros *et al.*, 2010). Firms recognise now the importance of interdependence; that is the degree to which each department’s success depends on the success of other departments within the firm (Rungtusanatham *et al.*, 2003; Wong *et al.*, 2011). Internal coordination between these functional departments is needed in order to realise the desired benefits of the firm (Chen and Paulraj, 2004b). To achieve collective goals, the different departments need to work together through information sharing and adopting

common vision and shared goals. This is the idea of inter-departmental collaboration (Kahn and Mentzer, 1998). Through collaboration amongst the functional departments, the duplicated efforts and time to perform activities are minimised. Moreover, through information sharing, goals and mutual understanding, personnel become more satisfied in collaborating with other departments (Kahn and Mentzer, 1998). The coordination amongst the internal production and supporting functions who strive to deliver a product or service to customers is essential to facilitate the flow of information and material (Barratt and Barratt, 2012) and improve the firm performance (Rungtusanatham *et al.*, 2003). In this context, information technology (IT) allows a seamless linkage between production and the point of purchase and delivery (Arshinder *et al.*, 2008; Saldanha *et al.*, 2013; Williams *et al.*, 2013; Blome *et al.*, 2014). This has often been achieved through general communication tools particularly email communication (Barratt and Barratt, 2012) and Enterprise Resource Planning (ERP) systems (Pagell, 2004; Rai *et al.*, 2006; Barratt and Barratt, 2012).

Cross-functional teams represent an example of collaboration between functional departments (Pagell, 2004). Cross-functional teams are “an integral part of the organisational structure where each team has defined goals, and roles and responsibilities of each team is identified” (Stewart, 1995, p43). The objective of cross-functional teams centres on collaboration between the different functional departments who might have competing interests (Vickery *et al.*, 2003). Firms have traditionally used cross-functional teams to manage various processes closely (Chen *et al.*, 2009a) in order to improve quality and innovation (Vickery *et al.*, 2003). Each team member may bring different orientations, thoughts, objectives and departmental culture to the cross-functional team (McDonough, 2000).

The resource-based view (RBV) of the firm, as previously discussed, advocates that the valuable, rare, difficult to imitate and substitute internal resources of the firm can contribute to generate a competitive advantage for the firm. The RBV explains why human, tangible, and intangible skills are important for the firm (Wernerfelt, 1984). The rare and specific information technology (IT) capabilities within a firm represent specific-skills that are considered a potential source of competitive advantage (Bharadwaj, 2000). IT infrastructure that enables information sharing across products and locations is central to the RBV (Bharadwaj, 2000). Sharing of internal specific-

knowledge that cannot be easily imitated is also seen as a source of competitive advantage (Grant, 1996; Tsai, 2002; Hult *et al.*, 2006; Blome *et al.*, 2014).

In summary, firms have long strived to accumulate internal resources through collaboration among the different functional departments. Such resources are seen as a potential source of generating a competitive advantage. However, due to the increased pressure to meet the challenges of globalisation, customer service, reducing time-to-market (Perols *et al.*, 2013), competitive markets (Cousins, 2005), shortening product life cycle and working in volatile environments (Blome *et al.*, 2014), firms started to recognise the importance of focusing on only specific types of activities and retain them in house (De Vita *et al.*, 2011). Other activities are to be performed beyond the firm's boundaries and outsourced to external parties (Burnes and Anastasiadis, 2003; McIvor, 2009; De Vita *et al.*, 2011). The following section will explain how firms have taken decisions about their boundaries limits and adopted outsourcing strategies.

2.4.1 Outsourcing

The origin of the term 'outsourcing' can be traced back to the 1980s as it was first used in the information systems ((Burnes and Anastasiadis, 2003; Espino-Rodriguez and Padron-Robaina, 2006). However, outsourcing is currently popular in most industries (McIvor, 2009) and considered one of the most important areas of business activity (Burnes and Anastasiadis, 2003). Espino-Rodriguez and Padron-Robaina (2006, p52) defined outsourcing as "a strategic decision that entails the external contracting of determined non-strategic activities or business processes necessary for the manufacture of goods or the provision of services by means of agreements or contracts with higher capability firms to undertake those activities or business processes, with the aim of improving competitive advantage". Firms have outsourced their activities to improve performance, cut cost and to benefit from higher economies of scale (Burnes and Anastasiadis, 2003; McIvor, 2009). Two powerful perspectives in studying the firm's boundaries have been the TCE and the RBV (McIvor, 2009) as discussed below.

- **Outsourcing from a Transaction-Cost Economics Perspective**

The TCE concept is one of the most influential theories in studying the firms boundaries (Grover and Malhotra, 2003; Geyskens *et al.*, 2006; Espino-Rodriguez and Padron-Robaina, 2006; De Vita *et al.*, 2011). The logic of the TCE approach in studying outsourcing is that firms need to consider the degree of investments being asset-specific

in the economic exchange as the critical determinant of whether a transaction needs to be managed within the organisational boundaries (Williamson, 1975; McIvor, 2009). Although asset specificity, uncertainty and frequency are all important for characterising a transaction, asset specificity is the critical factor in determining the outsourcing decision (McIvor, 2009; De Vita *et al.*, 2011). When asset specificity is high the potential of opportunistic behaviour increases which makes hierarchical governance more appropriate (Spring and Araujo, 2014). Market governance occurs when asset specificity and uncertainty are low. Medium asset specificity results in bilateral relations in terms of close partnerships. If the company outsources an asset-specific activity, transaction cost increases because of the fear of any possible opportunistic behaviour as a result of the deployment of this highly specific-asset (Grover and Malhotra, 2003).

One criticism of the TCE theory in taking the outsourcing decision is that it does not take into consideration the capabilities of the firms or their potential outsourcing partners (Espino-Rodriguez and Padron-Robaina, 2006; McIvor, 2009; De Vita *et al.*, 2011). This shortcoming is dealt with from the RBV perspective on outsourcing which is discussed in the following section.

- **Outsourcing from a Resource-Based View Perspective**

The other theoretical perspective for explaining the outsourcing decision is the RBV. The RBV argument in studying outsourcing is to outsource resources that have low strategic value and to retain in-house resources that are strategically important. The outsourcing decision is explained in terms of core competence which was discussed in the previous section. Resources underlying core competences should be protected by the organisation through managing them in-house and the remaining competences to be managed through external contracts (Prahalad and Hamel, 1990; Quinn and Hilmer, 1994). McIvor (2009) introduced an explanation for the importance of the RBV in taking the outsourcing decision. He stated that “the RBV is important to the study of outsourcing, as superior performance achieved in organisational activities relative to competitors, would explain why such activities are internalised within the organisation” McIvor (2009, p46). Espino-Rodriguez and Padron-Robaina (2006) viewed the uniqueness of resources in terms of asset specificity. They asserted that outsourcing of idiosyncratic resources of the firm is a costly transaction. Hence, companies should outsource only activities that have little or no asset specificity (McIvor, 2009).

A more substantial view of outsourcing can be explained by combining the two paradigms of the RBV and the TCE. This is introduced in the following section.

- **The Combination of TCE and RBV Perspectives on Outsourcing**

There is agreement in the literature that both the TCE and the RBV are important to the study of organisational boundaries (Tsang, 2000; Cousins, 2005; Espino-Rodriguez and Padron-Robina, 2006; McIvor, 2009). McIvor (2009) integrated TCE with the RBV to introduce a framework for outsourcing evaluation. The findings of his study suggested that TCE and the RBV can explain the complexities of outsourcing when they are used together and neither does that when studied separately. Similarly, Espino-Rodriguez and Padron-Robaina (2006) asserted that the TCE and RBV “are not directly opposed in the analysis of outsourcing; they complement each other while enriching the study of the outsourcing strategy”. Table 2.1 summarises how RBV and the TCE are used to study the outsourcing decision. In summary, both theories try to define the firm boundaries through different approaches or as Espino-Rodriguez and Padron-Robaina (2006, p55) put it: “TCE explains the negative consequences of outsourcing specific assets, while the RBV centres on the positive aspect of not outsourcing those activities comprising specific assets”.

	Transaction-cost economics (TCE)	Resource-based view (RBV)
Unit of analysis	<ul style="list-style-type: none"> • Transactions 	<ul style="list-style-type: none"> • Resources and capabilities
Behavioural assumptions	<ul style="list-style-type: none"> • Opportunism and limited rationality 	<ul style="list-style-type: none"> • Limited rationality (the firm does not master everything; it will do what is determined by its organisational routines)
Analysis for outsourcing	<ul style="list-style-type: none"> • Specific assets and the small numbers related to the transaction. • Only individual analysis of the transactions • Frequency of the transaction 	<ul style="list-style-type: none"> • Specific resources • Analysis of the resources as a whole • Skills and capabilities • Experience of supply chain suppliers and customers • Analysis of complementary capabilities
Criterion for outsourcing	<ul style="list-style-type: none"> • Minimising the transaction and production costs 	<ul style="list-style-type: none"> • Observe the creation of value
Desired effect on the organisation	<ul style="list-style-type: none"> • Efficiency • Better economic strategy • Tactical and operational decision 	<ul style="list-style-type: none"> • Competitive advantage • Strategic decision • Development of capabilities across organisational boundaries
Risks	<ul style="list-style-type: none"> • Dependence on supplier • Hidden costs • Post-contractual threat 	<ul style="list-style-type: none"> • Loss of critical skills • Supply chain partner lack of necessary capabilities
Internalisation of an activity	<ul style="list-style-type: none"> • Avoider of negative (opportunism) 	<ul style="list-style-type: none"> • Creator of positive (resources and capabilities)

Table 2.1: Transaction-cost economics versus the resource-based view (Adapted from Tsang (2000), Espino-Rodriguez and Padron-Robaina (2006) and De Vita *et al.*, (2011))

Cox (1996) took a step further in studying the outsourcing decision through combining the asset specificity of Williamson (1979) and the core competence approach of Hamel

and Prahalad (1994) but also discussing the type of the relationship needed with the outsourcing partner. Williamson (1979) viewed asset specificity as a ‘sunk cost’ that has no value outside the transaction. In the words of Rindfleisch and Heide (1997, p41): “assets with a high amount of specificity represent sunk costs that have little value outside a particular exchange relationship”. Cox criticised Williamson’s view in that he considers asset specificity as a sunk cost and neglects the future competitive position of the firm in the market. Thus, Cox (1996, p61) redefined asset specificity in relation to “whether or not the specific skills or knowledge of the organisation contribute to the maintenance or creation of sustainable positions for profit within specific supply and value chains”. Thus, specific-assets that develop overtime can be viewed as competences that might underlie a strategic type of resources (Reve, 1990; Teece *et al.*, 1997; Espino-Rodriguez and Padron-Robaina, 2006; De Vita *et al.*, 2011; Spring and Araujo, 2014). “Such competences are typically viable across multiple product lines, and may extend outside the firm to embrace alliance partners” (Teece *et al.*, 1997, p516). Therefore, various buyer-supplier relationships which are strategically aligned to the firm’s competences and degree of asset specificity (Reve, 1990) were suggested as shown in Figure 2.4 below.

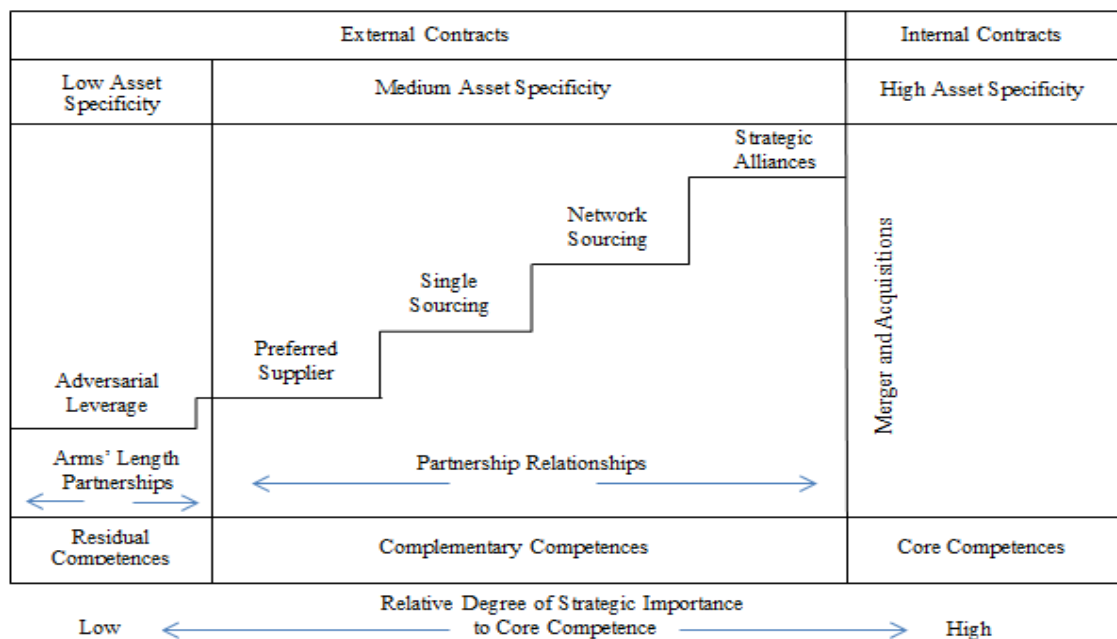


Figure 2.4: A typology of internal and external contractual relationships (Cox, 1996, p63)

The argument of this typology is that the core competences of high asset specificity contribute to attain a sustainable advantage need to be always managed in-house.

Complementary skills of medium asset specificity need to be outsourced beyond the firm's boundaries through close contracts based on versatile kinds of partnerships. For low asset specificity, the solution is outsourcing through traditional buy-sell relationships.

Hence, through combining asset specificity and core competence the reason for outsourcing an activity can be explained in terms of internalising core competences that are highly asset-specific and outsourcing the rest. Since the RBV suggests that distinctive resources can be a source of competitive advantage, it is argued that internalisation of high specific-assets that generate a difficult to imitate specific knowledge (Grant, 1996; Blome *et al.*, 2014) may improve the firm competitive advantage (Barney, 1991; De Vita *et al.*, 2011; Blome *et al.*, 2014). Moreover, specific-assets that develop over time between a customer and a supplier can be a source of competitive advantage (De Vita *et al.*, 2011; Barratt and Oke, 2007). This is similar to what is coined in the literature as extended RBV (ERBV) which suggests that competitive advantage might exist beyond the firm's boundary (Lewis *et al.*, 2010; Jia and Lamming, 2013).

The ERBV theorists suggest that the firm can enhance its competitive advantage through combining the resources that exist beyond its boundaries (Mathews, 2003; Arya and Lin, 2007; Squire *et al.*, 2009; Lewis *et al.*, 2010; Jia and Lamming, 2013). Such external resources can be a source of relational rents (Dyer and Singh, 1998) where "the nature of the relationships may matter more than the nature of resources in networked environments" (Lavie, 2006, p638). Mathews (2003) explained how the ERBV can be used to enhance firms' capabilities from an economic view where the RBV can be extended from a theory of the firm to a theory of the economy. Thus, the ERBV appears to accommodate both the relational (Dyer and Singh, 1998) and economic (Mathews, 2003) views. Lavie (2006) analysed the mechanisms for producing competitive advantage using the RBV and ERBV and argued that the firm's rents consist of internal rents, appropriated relational rents, inbound spillover rents and outbound spillover rents. Arya and Lin (2007) suggested that by applying the ERBV, the firm can develop additional capabilities through collaboration with other firms at the dyadic and network levels. Lewis *et al.* (2010) suggested that the firm can improve its competitive advantage through resource sharing with trading partners. A recent study by Jia and Lamming (2013) drew on the ERBV to understand how inter-firm and dyadic learning may produce improved performance. Their findings suggested that cultural adaptation

can lead to mutual benefits and inbound spillover rents for trading partners. Hence, “competitive advantage can no longer be ascribed to one firm’s internal resources alone” (Caldwell and Howard, 2014, p275). Thus, this view extends the RBV argument to potentially embrace the resources that reside outside the firm’s boundaries.

The previous discussion showed that competitive advantage can be derived from resources spanning the firm boundary. Having established the rationality for extending firms’ activities outside the organisational boundaries, and the importance of internalising resources from external environment, the next section introduces the concept of supply chain management and discusses its rationale and basic concepts.

2.5 Supply Chain Management

2.5.1 Supply Chain Management Development

There is an agreement in much literature on the origin of supply chain management as derived from the seminal work of Forrester (1961) on industrial dynamics (Croom *et al.*, 2000; Arshinder *et al.*, 2008). However, the interest in supply chain management was not shown until 1980s (Croom *et al.*, 2000) when companies recognised the importance of customer service, reducing time-to-market and extending its boundaries to stay competitive in increasingly globalised (Ellram, 1991; Blome *et al.*, 2014) and competitive markets (Cousins, 2005).

The concept of supply chain management started to develop in literature as a scholarly study in the early 1990s (Ellram and Carr, 1994; de Treville *et al.*, 2004; Cousins, 2005; Arshinder *et al.*, 2008). The original view of the supply chain has an intra-organisational focus and concentrated primarily on the integration of internal functions of the firm (Harland, 1996; Flynn *et al.*, 2010). The scope of supply chain management has broadened over time to be focused on inter-organisational issues (Koufteros *et al.*, 2010). A large number of terminologies have existed in literature to describe the supply chain management phenomenon such as integrated purchasing strategy, integrated logistics, supplier integration, strategic supplier alliances, supply base management, buyer-supplier partnerships, supply network, supply chain synchronisation, network supply chain and supply pipeline management (Croom *et al.*, 2000). The next section introduces the definition of the supply chain and explains this thesis’ view of the existence of supply chains.

2.5.2 Supply Chain Definition and Rationale

A number of definitions exist in literature for the term ‘supply chain’. Chopra and Meindl (2010, p20) suggested that “a supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request. The supply chain includes not only manufacturers and suppliers, but also transporters, warehouses, retailers, and even customers themselves”. This definition puts emphasis on the large number of parties participating in meeting customers’ requests. Table 2.2 summarise a number of definitions of supply chain management.

Study	Definition
Lambert <i>et al.</i> (1998, p504)	“The integration of business processes from end customer through original suppliers that provides products, services, and information that add value for customers.”
Bagchi and Skjoett-Larsen (2002, p90)	“The entire set of processes, procedures, the supporting institutions, and business practices that link buyers and sellers in a marketplace.”
Christopher (2005, p5)	“The management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole.”
Harrison and Van Hoek (2005, p7)	The supply chain is “a group of partners who collectively convert a basic commodity (upstream) into a finished product (downstream) that is valued by end-customers, and who manage returns at each stage”. Supply chain management is “the end to end management of the network as a whole, and of the relationships between the various links.”
CSCMP (2010, p180)	“The planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers.”
Chopra and Meindl (2010, p20)	“A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request. The supply chain includes not only manufacturers and suppliers, but also transporters, warehouses, retailers, and even customers themselves.”

Table 2.2: Definitions of supply chain management

Harrison and Van Hoek (2005) viewed the supply chain as a collection of processes that extend across the boundaries of organisations. Figure 2.5 shows how the focal firm is linked with the ‘upstream or buy side’ and ‘downstream or sell side’ members of the supply chain and its internal production and supporting functions are able to coordinate with both sides. The term ‘upstream’ is used to describe the purchasing side from tier 1 suppliers for the focal firm whereas the term ‘downstream’ is used to describe the physical distribution of products to tier 1 customer. Tier 1 suppliers and tier 1 customers deal with Tier 2 suppliers and customers respectively. Hence, supply chain management appears “as the end to end management of the network as a whole, and of the relationships between the various links” (Harrison and Van Hoek, 2005, p10).

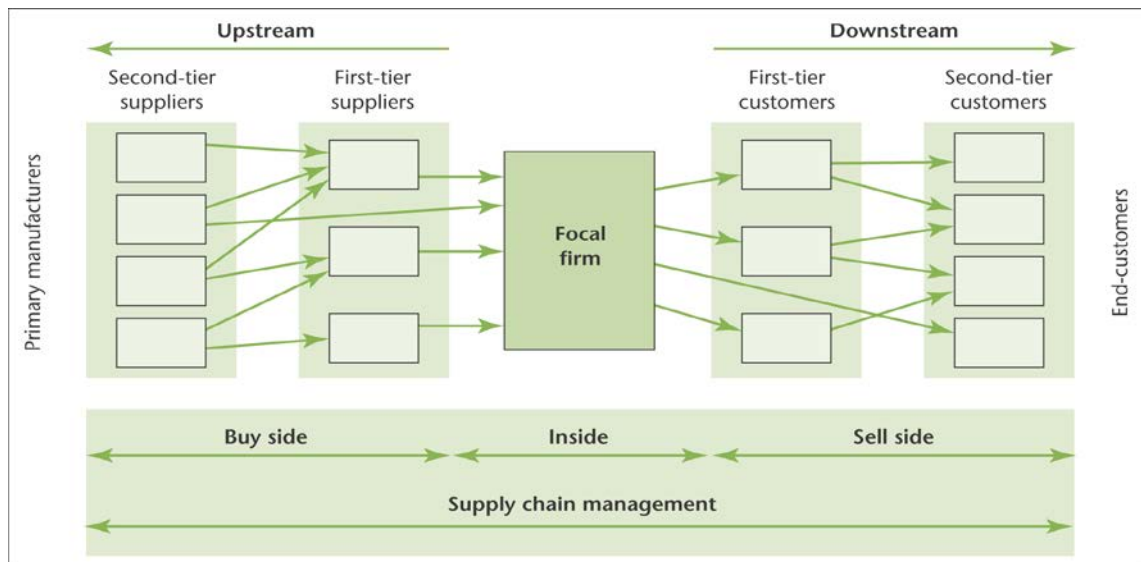


Figure 2.5: Supply chain management (Harrison and Van Hoek, 2005, p9)

Cox (2001) viewed the supply chain as a network that results from the basic need for economic exchange between firms. This economic exchange is similar to what Williamson (1979) referred to as a transaction between trading firms. This definition largely explains the rationale behind supply chains which is the presence of transactions. In theory, transactions are performed in-house only when there are core competences of high asset specificity. Otherwise, transactions are governed by traditional market mechanisms or through bilateral relations to obtain complementary resources. Because complementary competences of medium asset specificity are still important for the firm's position in the market, bounded rationality and fear of opportunism make firms work closely with their suppliers and customers. RBV suggests that firms perform activities through trading partners where no advantage can be gained from performing these activities internally. The increased competition in the marketplace made firms focus on strategic resources and obtain the rest from the external environment. Taken together, the efficiency gained from performing particular transactions through trading partners (TCE), and the need for additional capabilities to stay competitive in the market (RBV), firms found themselves working within supply chains rather than as individual entities. This is the idea of supply chain where the success of one company depends on the success of its upstream suppliers and downstream customers.

Figure 2.6 below summarises the use of theory in this chapter and the remaining of the thesis.

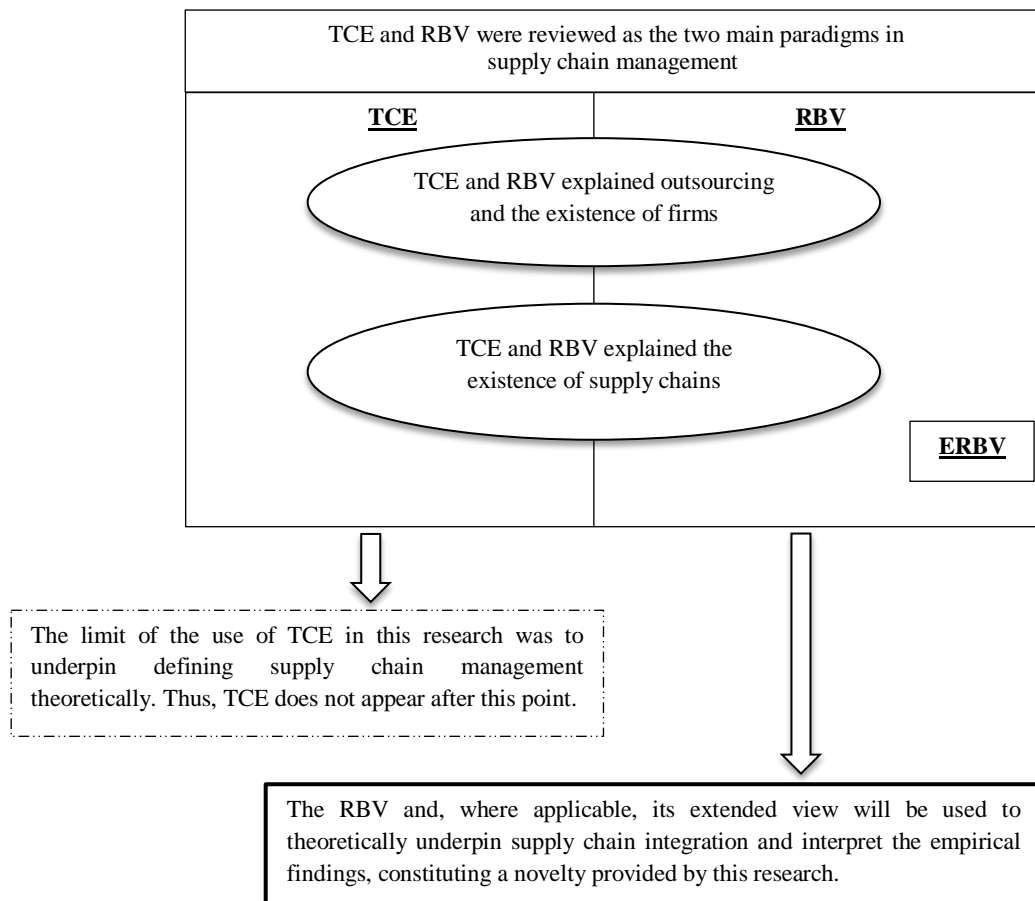


Figure 2.6: The use of theory in the thesis

There has been an intensive discussion amongst scholars about the need for supply chain members to have closer relationships in order to leverage their capabilities (Lorenzoni and Lipparini, 1999; Rungtusanatham *et al.*, 2003; Barratt and Oke, 2007). It has been suggested that to access complementary resources that exist beyond the boundaries of the firms as previously discussed in this chapter, firms need to build long-term relationships that might lead to improved competitive advantage. The next chapter will discuss supply chain relationships and supply chain integration.

2.6 Chapter Summary

This chapter has reported on the literature review of organisational boundaries and supply chain management. The chapter started by reviewing the main theoretical paradigms in supply chain management of TCE and RBV. The combination of both TCE and RBV perspectives offered a theoretical basis for defining supply chain management. However, there is still limited application of RBV across the supply chain for improved competitive advantage. Through extending the application of the RBV beyond the firm's boundaries, many scholars argued that developing unique

relationships and linkages with supply chain partners is a resource that may create capabilities for the firm (Das and Teng, 2000; Gulati *et al.*, 2000; Rungtusanatham *et al.*, 2003; Cousins and Menguc, 2006). This research builds on this argument in literature through using the RBV for underpinning supply chain relationships and the theoretical framework of supply chain integration. Thus, the RBV is the main lens in this research and the use of the TCE was limited to underpin defining supply chain management. Issues concerning the supply chain relationships will be discussed in the next chapter aiming to present how firms acquire resources from the external environment. The next chapter will also introduce the concept of supply chain integration.

3. Supply Chain Integration and the Developed Theoretical Framework

This chapter aims at gaining an understanding of the concept of supply chain integration. Building on the previous chapter, this chapter starts by discussing supply chain relationships and issues concerning the way firms interact in their supply chains. This leads to defining the concept of supply chain integration which is viewed as a means to combine complementary resources across the firm's boundary. Through combining internal and external components of integration, a theoretical supply chain integration framework will be developed in this chapter. As supply chain management is still an immature discipline (Harland *et al.*, 2006), theory needs to be used and developed in order to make progress in the field (Rungtusanatham *et al.*, 2003). RBV is used to provide grounding for the theoretical supply chain integration framework. Because of the ambiguity and lack of agreement in literature on the components and levels of supply chain integration (Pagell, 2004; Flynn *et al.*, 2010; Turkulainen and Ketokivi, 2012), a detailed discussion will be introduced to develop the levels and components of the theoretical framework. Figure 3.1 below shows the structure of Chapter 3 and how it was developed from the previous chapter.

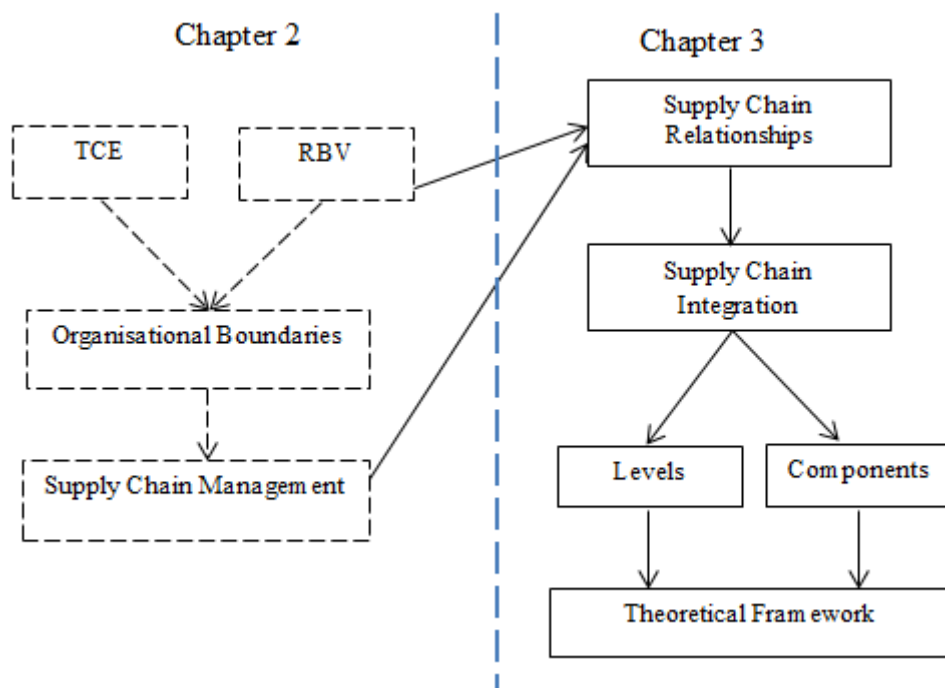


Figure 3.1: A simplified structure of the literature review (Chapter 3)

3.1 Supply Chain Relationships

It is widely established now in literature that competition is based on supply chain versus supply chain rather than firm versus firm (Spekman *et al.*, 1998; Croom *et al.*, 2000; Lambert and Cooper, 2000; Harland *et al.*, 2007; Towers and Burnes, 2008; Wang and Chan, 2010; Singh, 2011; Caridi *et al.*, 2014). Firms are no longer able to compete as single entities but rather seek to increase the competitiveness of their supply chains by working closely and building relationships with suppliers and customers (Min *et al.*, 2005; Wang and Chan, 2010). The last few years witnessed a consistent growth of literature on inter-organisational relationships (Cousins, 2005; Flynn *et al.*, 2010; Zhao *et al.*, 2011; Barratt and Barratt, 2012; Williams *et al.*, 2013). A relationship is the term that encompasses different degrees of interaction across the supply chain. Towers and Burnes (2008, p350) defined a relationship as “the exchange of information to joint benefit of the buyer and supplier”. Maloni and Benton (1997, p420) stated that “the relationship is usually created to increase the financial and operational performance of each channel member through reductions in total costs, reductions in inventories throughout the supply chain, and increased levels of shared information”. Several terms have been used to describe the act of information sharing and resources and working closely with the supply chain members based on close relationships. This has been referred to in literature as inter-organisational relationships, co-operation, co-ordination, collaboration, partnership and integration (Chen *et al.*, 2009a). Arshinder *et al.* (2008, p317) argued that “the terms like integration, collaboration, cooperation and coordination are complementary to each other and when used in the context of supply chain can easily be considered as a part of supply chain coordination”. Chen *et al.* (2009a, p27) stated that “integration is often used interchangeably with other related but distinct concepts such as cooperation and collaboration”. McDonough (2000, p226) described cooperation as a term that “... has been previously defined as collaboration, teamwork, interaction, communication and integration”. The literature is overflowing with such terms which make it confusing for researchers. Therefore, such terms have been often defined and used in literature according to the research purposes. The following section will introduce some discussion of the concepts of cooperation, coordination, collaboration and partnership in order to ensure a precise use of them but also to understand how firms interact and link together in a supply chain system.

3.1.1 Interaction in the Supply Chain

Despite the popularity and continuous support in literature of the new competition model based on supply chain against supply chain (Caridi *et al.*, 2014), it needs to be

recognised that in reality, supply chain partners tend to have different and conflicting interests and objectives (Harland *et al.*, 2007; Yeung *et al.*, 2009; Wang and Chan, 2010). Therefore, it is important to organise the activities of participants in a synchronous way to ensure customers' requirements are met efficiently (Wang and Chan, 2010). This is the idea of supply chain coordination. Spekman *et al.* (1998) introduced a useful explanation of the difference between co-operation, co-ordination, and collaboration in the supply chain. They argued that co-operation, whereby organisations exchange important information and engage suppliers and customers in long-term contracts, represents the lowest level of interaction between supply chain members. Co-operation is a term that has been used in literature to describe supply chain relationships that have relatively little interdependency (Spekman *et al.*, 1998; Mentzer *et al.*, 2000; Menachof and Son, 2002). Co-ordination, whereby transacting firms try to ensure a seamless flow of information and resources, represents the next level of interaction intensity among supply chain members.

Despite the importance of co-operation and co-ordination for supply chain management, a higher level of interaction intensity is needed in order to have an integrated supply chain management (Spekman *et al.*, 1998). This is represented by collaboration based on mutual understanding to achieve a higher level of interaction between trading firms (Spekman *et al.*, 1998). Figure 3.2 shows four steps for moving from open market negotiation based on adversarial relationships to collaboration which represents the highest level of interaction and integration. When co-operation and co-ordination are supported by mutual understanding, trading firms may get involved in broader collaborative behaviours (Spekman *et al.*, 1998).

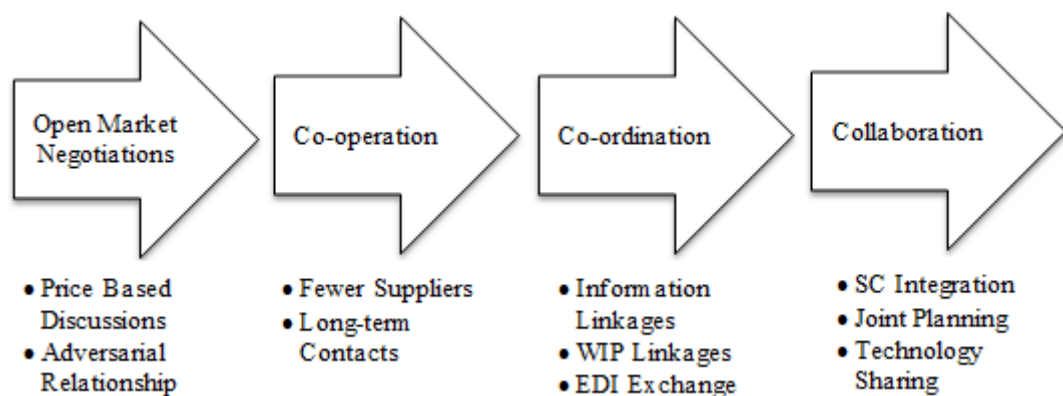


Figure 3.2: The key transition from open-market negotiations to collaboration (Spekman *et al.*, 1998, p57).

Hence, it is derived from the above discussion that coordination and collaboration represent a higher degree of interaction between supply chain members than cooperation. Coordination is needed to organise and facilitate the interaction between trading firms. To better understand coordination in the supply chain, the next section will clarify what needs to be coordinated across the supply chain and what benefits the participating firms can reap.

3.1.2 The Coordination of Supply Chain Flows

Literature emphasises the importance of managing of three supply chain flows of material, financial and information (Greis and Kasarda, 1997; Lee, 2000; Xue *et al.*, 2007; Comelli *et al.*, 2008; Silvestro and Lustrato, 2014). Greis and Kasarda (1997) stated that since the early 1980's firms have recognised the importance of managing information and material flows with their partners in order to source, manufacture and deliver products efficiently to the marketplace. The supply chain is made up of physical and information flows that initiate from beyond the boundaries of the firm (Perry and Towers, 2013). Xue *et al.* (2007) asserted that the supply chain consists of a group of relationships and organisations who organise the flows of material, information and cash between the supply chain members. Comelli *et al.* (2008) asserted that a firm's supply chain is characterised by three types of flows being material, financial and information. Lee (2000) stressed that effective and efficient management of information, material and financial flows is essential for improving supply chain performance. See Figure 3.3 below.

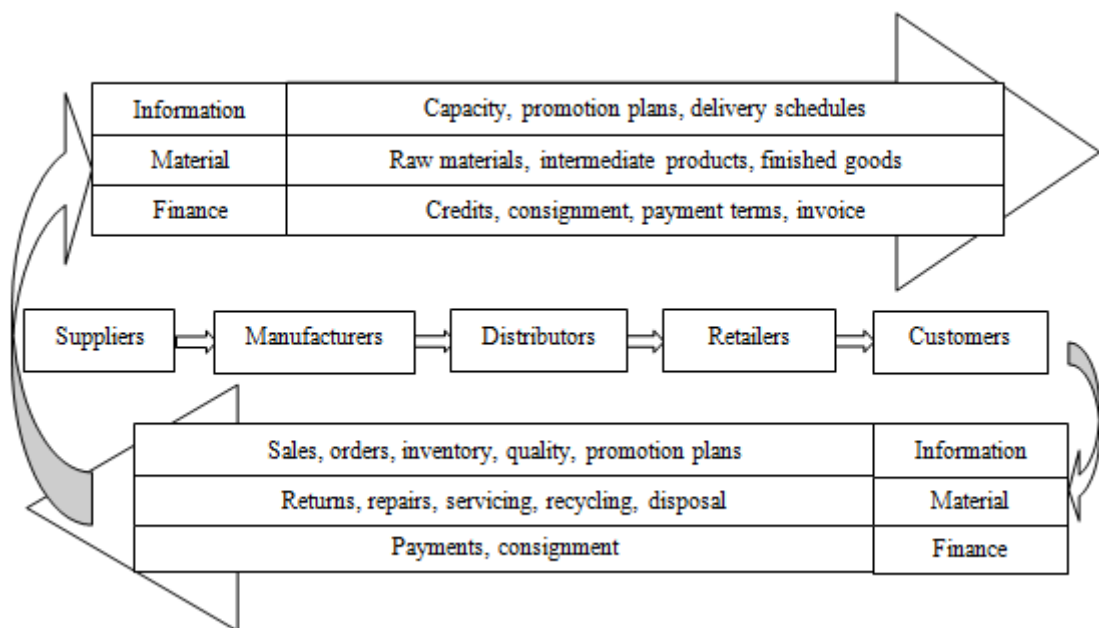


Figure 3.3: The supply chain flows (Lee, 2000, p32)

These three supply chain flows of information, material and financial are now discussed in detail.

- **Information Flow**

Information flow has received wide attention in supply chain literature. Information flow is essential to perform internal linkages with the different business units within the firm but also with suppliers and customers (Lee *et al.*, 1997). There are two main views concerning the issue of information sharing in the supply chain (Kembro and Naslund, 2014). The first and most predominant view in literature strongly supports the need for information sharing in order to achieve vital improvements for the supply chain members (e.g. Lee *et al.*, 1997; Hoyt and Huq, 2000; Moberg *et al.*, 2002; Rai *et al.*, 2006; Kocoglu *et al.*, 2011; Saldanha *et al.*, 2013; Mishra *et al.*, 2013; Caridi *et al.*, 2014). This predominant stream of literature has viewed information sharing throughout the supply chain as a necessary tool for having an effective and competitive supply chain (Berry and Naim, 1996; Zhao *et al.*, 2002; Sezen, 2008; Kocoglu *et al.*, 2011; Barratt and Barratt, 2012; Kembro and Naslund, 2014). It allows the coordination of material flow (Gustin *et al.*, 1995; Frohlich and Westbrook, 2001; Comelli, 2007; Mishra *et al.*, 2013; Saldanha *et al.*, 2013; Lee and Cho, 2014) and financial flow in the supply chain (Comelli, 2007; Silvestro and Lustrato, 2014). Information sharing may result in lower inventory costs across the supply chain (Lee *et al.*, 1997; Strader *et al.*, 1999; Lee *et al.*, 2000; Graham and Hardaker, 2000; Saldanha *et al.*, 2013; Lee and Cho, 2014), more efficient use of resources (Graham and Hardaker, 2000, Lee *et al.*, 2000), shorter order cycle time (Strader *et al.*, 1999), improved forecasting, demand planning and replenishment (Rai *et al.*, 2006), higher sales, improved inventory management, better understanding of demand (Kaipia and Hartiala, 2006; Mishra *et al.*, 2013; Caridi *et al.*, 2014) and reducing the bullwhip effect (Lee *et al.*, 1997; Rai *et al.*, 2000; Dejonckheere *et al.*, 2004). The bullwhip effect is a phenomenon that occurs due to the large amplifications in demand across the supply chain as a result of changes in the final customer's demand (Dejonckheere *et al.*, 2004; Geary *et al.*, 2006). The other stream of literature questioned the costs associated with information sharing (e.g Cousins and Menguc, 2006; Chu and Lee, 2006; Roh *et al.*, 2008; Vanpoucke *et al.*, 2009). Vanpoucke *et al.* (2009) raised the issue of the benefits gained from information sharing comparing to the high costs associated with the information technology implementation. This stream of literature also raised the issue of complexity of

information sharing represented by determining what information to share and with whom (Kembro and Naslund, 2014). However, this stream of literature confirmed the significant role of information sharing in the supply chain (Cousins and Menguc, 2006; Roh *et al.*, 2008; Vanpoucke *et al.*, 2009; Kembro and Naslund, 2014).

There are two main types of information in the literature; operational and strategic (Moberg *et al.*, 2002; Vanpoucke *et al.*, 2009). Operational information includes information shared on a daily basis and related to sales, logistics activities such as delivery schedules and inventory levels, and production activities such as production schedules and order status (Moberg *et al.*, 2002; Kembro and Naslund, 2014). Such information helps reducing cycle time, inventory levels and improving service levels (Moberg *et al.*, 2002). Strategic information is associated with sharing marketing, logistics resources planning, capacity planning and long-term forecasting information (Moberg *et al.*, 2002; Kembro and Naslund, 2014). The purpose of this type of information is to improve collaboration across the supply chain and plan future logistics practices (Moberg *et al.*, 2002; Rai *et al.*, 2006; Mishra *et al.*, 2013; Caridi *et al.*, 2014) and the ability of firms to improve its long-term competitiveness (Kembro and Naslund, 2014). The efficient flow of both operational and strategic information within the supply chain can support generating a sustainable competitive advantage (Hoyt and Huq, 2000).

- **Material Flow**

Material management refers to the acquisition and storage of raw materials, components, and finished goods. It also includes physical distribution which relates to activities such as order processing, inventory deployment, storage and handling, and transportation (Min and Zhou, 2002). Material management is essential for the efficient flow of raw materials and finished goods across the different departments including purchasing, warehousing, shipping and distribution (Min and Zhou, 2002). Keeping material flowing is also an important aim of the supply chain (Silvestro and Lustrato, 2014). Material flow needs to be synchronised in a way that prevents build-ups and interruptions of inventory (Harrison and Van Hoek, 2005). A well-coordinated flow of material enables firms to deliver products to end customers in a timely, efficient and effective way (Silvestro and Lustrato, 2014). Firms have implemented several practices and initiatives for synchronising the flow of material with their suppliers and customers

(Daugherty *et al.*, 1996; Pagh and Cooper, 1998; Yao *et al.*, 2007). For example, through supplier's participation in managing customers' inventory firms have gained advantages in reducing the possibility of stock shortage and overage and improving forecasting (Yao *et al.*, 2007). Cooperative initiatives and practices include close coordination of the management of the flows of raw material, semi-finished goods and products to contribute to improved customer services levels and improved profitability across the supply chain (Pagh and Cooper, 1998; Christopher, 2005).

A concept related to material management is logistics management. Logistics has been defined in literature according to the research purpose. However, all definitions revolve around planning the flow of material and related information in an efficient and effective manner across the supply chain (Daugherty *et al.*, 1996; Pagh and Cooper, 1998; Christopher, 2005; Waters, 2009). One of the most widely cited definitions of logistics in literature is the definition of the Council of Supply Chain Management Professionals (CSCMP). "Logistics is that part of the supply chain process that plans, implements and controls the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption in order to meet customer requirements" (CSCMP, 2010, p114). The first dedicated academic work on logistics is referred to the seminal work of Drucker (1962) who described logistics as 'the economy's dark continent' (Waters, 2009; Fernie *et al.*, 2010). By the early 1970s, as economic pressures on business started to grow, companies started to look for new approaches to improve their efficiencies. Since then, logistics has been realised by many businesses as a function that could make considerable savings and considered as one of the most dynamic areas of business (Waters, 2009). Logistics has extended beyond the firm boundaries as a result of collaboration agreements between supply chain members (Chen and Paulraj, 2004a). Hence, the coordination of logistics activities can be seen as a tool for managing resources with supply chain partners. The smooth flow of material can be seen as a potential source of competitive advantage from the RBV perspective (Rungtusanatham *et al.*, 2003; Chen *et al.*, 2009a).

It's worth noting from the above discussion that logistics includes not only the flow of material but also information related to the management of material. As information flow was discussed in a different section, this thesis will use the term logistics to describe the physical part which is related to material flow. Hence, this thesis will use the term logistics to describe the physical material flow.

- **Financial Flow**

Financial flow includes both the upstream and downstream actors in the supply chain (Silvestro and Lustrato, 2014). Examples of downstream financial resources are prices, invoices, and credit terms whereas the upstream resources include payments to suppliers and account payables (Lee, 2000; Rai *et al.*, 2006). The cash-to-cash cycle, “the length of time between cash payment for purchase of resalable goods and collection of accounts receivable generated by sale of these goods” (Moss and Stine, 1993, p25), is an important factor in the context of managing financial flows. The importance of shortening the cash-to-cash cycle is represented by lowering financial costs to fund carrying out business operations. The cash-to-cash cycle is largely dependent on the supply chain capability (Tsai, 2008). The effective flow of financial resources between the focal firms and its suppliers and customers results in shorter cash-to-cash cycle by reducing days-in-inventory, shortening days-in-receivables and extending days-in-payables (Tsai, 2008; Zolait *et al.*, 2010). Therefore, financial flow was considered by some authors as a key element of the supply chain (Farris and Hutchison, 2002; Johnson and Mena, 2008; Silvestro and Lustrato, 2014).

A higher level of interaction between supply chain members can be explained in terms of building close and long-term relationships based on mutual understanding. Therefore, this thesis now takes a step further in describing interaction amongst supply chain actors and explains collaboration as another important term in supply chain relationships.

3.1.3 Collaboration in the Supply Chain

Arms-lengths agreements have long dominated the way buyers and suppliers perform their transactions (Nyaga *et al.*, 2010). It was not until the early 1990s that firms started to recognise the importance of collaborative approaches and information sharing (Hoyt and Huq, 2000). The rationality for collaboration is that firms are no longer able to compete as single entities (Min *et al.*, 2005; Towers and Burnes, 2008). Collaboration was defined by Min *et al.* (2005, p237) as “two or more companies sharing the responsibility of exchanging common planning, management, execution, and performance measurement information”. Nyaga *et al.* (2010) viewed collaborative relationships in terms of information sharing, dedicated investments and joint relationship efforts. Capitalising on previous literature, Cousins (2005) summarised three types of organisational collaboration namely operational, marketing and strategic.

Operational collaboration is associated with information sharing on production process including forecasting, scheduling and capacity planning. Marketing collaboration is pertaining to customer facing issues including managing marketing channels, developing co-brands and joint-selling. Strategic collaboration is concerned with information sharing on key areas such as technology, finance and design. Menachof and Son (2002) classified collaboration in supply chain into two types. The first type focuses on collaboration through logistics and manufacturing activities. This type reflects the operational perspective of supply chain management. The second type extends to include activities that are related to non-logistics activities. It is based on the idea that supply chain management includes collaborative activities other than logistics to the management of business processes. From the RBV perspective, where there are resource constraints, collaboration offers firms an opportunity to access complementary capabilities (McIvor, 2009). Firms are in a position of generating a competitive advantage when they collaborate to share knowledge and resources (Dyer and Singh, 1998; Hoyt and Huq, 2000).

In summary, collaboration among supply chain actors is needed in order to compete in today's business environments. Long-term relationships that are created between supply chain partners based on collaboration need to be underpinned by mutual understanding and willingness to maintain the relationship (Morgan and Hunt, 1994; Nyaga *et al.*, 2010). Consequently, the next section will explain the importance of long-term relationships.

3.1.4 Building Close Relationships in the Supply Chain

Mutual understanding between the partnering firms plays a key role in supply chain relationships (Nyaga, *et al.*, 2010; Zhang and Huo, 2013) and the stability of the supply chain (Kwon and Suh, 2005; Yeung *et al.*, 2009). A substantive number of previous studies have supported the importance of mutual understanding and having common beliefs for building successful relationships (Ganesan, 1994; Doney and Cannon, 1997; Lorenzoni and Lipparini, 1999; Nyaga *et al.*, 2010). It is essential for firms to have confidence in a trading partner's reliability and integrity (Morgan and Hunt, 1994; Zhang and Huo, 2013) and the belief that they will act based on the agreed manner (Spekman *et al.*, 1998). Moorman *et al.* (1993, p82) suggested that "a willingness to rely on an exchange partner in whom one has confidence" is necessary for the success of the relationship. The long-term relationships based on trust and mutual understanding

increases the expectation that the supply chain partner will not engage in opportunistic behaviours (Reve, 1990; Li *et al.*, 2007; Zhao *et al.*, 2011).

The belief that supply chain partners will dedicate resources to sustain a relationship is essential for the development of long-term relationships (Spekman *et al.*, 1998). Willingness in the relationship that is “an exchange partner believing that an on-going relationship with another is so important as to warrant maximum efforts at maintaining it” (Morgan and Hunt, 1994, p23) reflects that there is mutual understanding between the trading partners. The willingness to invest in financial or physical resources for the continuity of the relationship (Zhao *et al.*, 2008) is also important for building successful relationships.

Supply chain members who achieved mutual understanding will have a higher degree of satisfaction with their relationship and will dedicate resources to ensure its continuity (Prajogo and Olhager, 2012). Such dedication of resources to maintain a relationship will need high commitment from trading partners (Morgan and Hunt, 1994; Nyaga *et al.*, 2010). Therefore, high levels of commitment cannot be achieved unless the supply chain partners feel that there is high trust and mutual understanding in the relationship (Kwon and Suh, 2005; Zhang and Huo, 2013).

The previous discussion focused implicitly or explicitly on the existence of long-term relationships and mutual understanding among the supply chain partners. RBV scholars argued that collaboration based on mutual understanding offers firms resources that are rare, valuable, and are hard to imitate and substitute (Lengnick-Hall, 1996; Dyer and Singh, 1998; Hoyt and Huq, 2000; Barratt and Oke, 2007). When mutual understanding is developed through effective communication, it can produce capabilities that are sources of competitive advantage (Lengnick-Hall, 1996).

The highest level of interaction between supply chain actors is partnerships (Spekman *et al.*, 1998). The next section will discuss supply chain partnerships.

3.1.5 Supply Chain Partnerships

When the relationship between two organisations is close and on-going, literature refers to this as a ‘partnership’ (Kalwani and Narayandas, 1995; Ellram and Hendrick, 1995; Burnes and New, 1996; Fearne and Duffy, 2004). Other authors have defined partnerships with an emphasis on the existence of high level of interdependence and

mutual objectives between the partnering organisations (Mohr and Spekman, 1994; Maloni and Benton, 1997). Also termed a strategic alliance (Maloni and Benton, 1997), a partnership is defined as “a tailored business relationship based on mutual trust, openness, shared risk, and shared rewards that yields a competitive advantage, resulting in business performance greater than would be achieved by the firms individually” (Lambert *et al.*, 1996, p2). Partnership was also defined as “a relationship between two entities in the logistical channel that entails a sharing of benefits and burdens over some agreed upon time horizon” (Ellram and Cooper, 1990, p2).

The early 1990s witnessed an intensification of research on the supply chain partnership (Burnes and New, 1996; Hines and McGowan, 2005). Literature supported the role of supply chain partnerships as a requisite for the success of the whole supply chain (Lambert *et al.*, 1996; Maloni and Benton, 1997; Fiala, 2005; Yeung *et al.*, 2009). Managing the supply chain as a single entity would not be possible without a strategic partnership (Yeung *et al.*, 2009). Firms have traditionally partnered with supply chain members to reduce certainty and increase profitability across the supply chain with the hope of the ultimate customer receiving higher quality, cost-effective products in a shorter time (Maloni and Benton, 1997; Fiala, 2005). Fiala (2005) suggested that supply chain partnership benefits include improved information flow, reduced uncertainty, higher quality, and higher profitability for the whole supply chain at reduced product costs for end-users. Hines and McGowan (2005) argued that through strategic partnerships with suppliers, organisations are able to overcome uncertainty in turbulent business environments and deliver products more efficiently. Das and Teng (2000) explained the importance of alliances in acquiring valuable resources from outside the firm through combining firms’ resources. Firms can access valuable resources from external parties through strategic alliances (Grant, 1991; Das and Teng, 2000).

The high degree of interaction between trading firms implies the intensity of the use of strategic activities but also inter-organisational information systems (Saldanha *et al.* 2013). The next section will explain the importance of information technology in managing supply chain relationship complexities.

3.1.6 The Role of Information Technology in Supply Chain Relationships

The importance of Information Technology (IT) to supply chain management is not in doubt (Chen and Paulraj, 2004a; Gunasekaran and Ngai, 2004; Campbell and Sankaran,

2005). A recent view on how supply chain actors link together looks at the role of inter-organisational systems which connect several organisations in a supply chain (Kim *et al.*, 2011; Saldanha *et al.* 2013). These inter-organisational systems have contributed to process transformation that is necessary for managing networks effectively (Greis and Kasdara, 1997; Chen and Paulraj, 2004; Kocoglu *et al.*, 2011; Saldanha *et al.* 2013). IT allows firms to increase the quantities of information shared across the supply chain, obtain real-time information necessary to manage the supply chain activities, and improve the alignment of forecasting and the scheduling of operations between supply chain partners (Chen and Paulraj, 2004a; Prajogo and Olhager, 2012; Saldanha *et al.* 2013). IT allows a seamless linkage between production and point of purchase and delivery (Arshinder *et al.*, 2008). Vickery *et al.* (2003, p525) stated that “computerised productions systems serve to integrate manufacturing activities into an overall planning system that typically stretches beyond the boundaries of the manufacturing unit... these systems are used for planning, tracking and ordering components and products throughout the manufacturing operations and can be used to strengthen linkages with outside suppliers”. Previous research suggested that the technological adoption of Electronic Data Interchange (EDI) was necessary for facilitating supply chain relationships (e.g. Rosenzweig *et al.*, 2003; Gunasekaran and Ngai, 2004; Mishra *et al.*, 2013). Conversely, Deveraj *et al.* (2007) found that an EDI connection does not provide high benefits to the supply chain comparing to the more integrated technologies that provide a comprehensive order-processing capabilities. For instance, Point-of-Sale (POS) systems and Collaborative Planning System (CPS) provide a real-time access and automatic transfer of data.

RBV views IT as a resource that enables the firm to produce a competitive advantage (Wernerfelt, 1984). Firms have benefited from intra-organisational and inter-organisational technologies for sharing information and achieve a competitive advantage (Wu *et al.*, 2006; Barratt and Barratt, 2012; Saldanha *et al.*, 2013). However, since IT systems can be easily implemented by other organisations, it is important that such technology is difficult to imitate by other firms (Wu *et al.*, 2006; Fawcett *et al.*, 2009).

Regardless of the degree of interaction amongst supply chain members, firms have built relationships with each other in order to access complementary resources that exist beyond their boundaries. The following section will summarise the importance and rationale for interacting and building close relationships with the supply chain members.

3.1.7 Supply Chain Linkages

Firms are now aware of the importance of interdependence between internal production and supporting functions but also with external suppliers and customers (Rungtusanatham *et al.*, 2003). To achieve the new competition model based on supply chain against supply chain, the supply chain members seek effective use of resources and capabilities through developing inter-organisational linkages in order to ensure a seamlessly coordinated supply chain (Barratt and Barratt, 2012). These linkages are important to facilitate the flow of inbound and outbound material and information (Lee *et al.*, 2007). A linkage is created between firms when they are engaged in business transactions (Choi *et al.*, 2001). Each supply chain link represents a relationship between any two trading firms (Stock *et al.*, 2000; Towers and Burnes, 2008). Stock *et al.* (2000) viewed supply chain links as the nature of the relationships between customers and suppliers in the supply chain. Supply chain links was defined as “the relationship between suppliers and customers comprising the supply and distribution channel” (Stock *et al.*, 2000, p535). Rungtusanatham *et al.* (2003, p1084) referred to supply chain linkages as “explicit and/or implicit connections that a firm creates with critical entities of its supply chain in order to manage the flow and/or quality of inputs from suppliers into the firm and of outputs from the firm to customers”. This definition explains that a linkage in a supply chain is a result of any type of connection between the participants. Stating the importance of linkages for facilitating the information and goods flows in this definition is consistent with Lee *et al.* (2007, p445) who viewed linkages among internal processes, suppliers and customers as a necessity to “facilitate information flow of inbound and outbound flow of information and goods/services”.

It is well established that in order for firms to compete in their business environments they need to acquire complementary resources from the external environment (Reve, 1990; McIvor, 2009). Firms can accumulate resources in unique ways across their boundaries to obtain a competitive advantage (McIvor, 2009; Jia and Lamming, 2013). Some forms of inter-relationships have been viewed in literature as a means to obtain external resources (Cousins and Menguc, 2006; Lewis *et al.*, 2010). Given that inter-firm linkages represent a form of inter-relationships (Stock *et al.*, 2000; Rungtusanatham *et al.*, 2003; Towers and Burnes, 2008); it is argued that these linkages may work as a vehicle to acquire external resources. Some recent studies have viewed supply chain linkages as resource acquisition capabilities that may generate a

sustainable competitive advantage for the firm (Rungtusanatham *et al.*, 2003; Barratt and Oke, 2007). In the course of developing a framework to understand the advantages of a firm's linkages in a supply chain on its internal operational performance, Rungtusanatham *et al.* (2003) viewed linkages as capabilities that generate competitive benefits for the firm. Similarly, building on Rungtusanatham *et al.* (2003) work, Barratt and Oke (2007) explored how the use of organisational linkages that constitute competitive resources can provide a competitive information visibility in a supply chain network. Cousins and Menguc (2006) argued that linking with suppliers through socialisation is viewed as a strategic resource of the firm and can positively affect both supplier communication and supplier operational performance. This is the idea of supply chain integration where suppliers, manufacturers, and customers are linked together (Campbell and Sankaran, 2005; Schoenherr and Swink, 2012). Integrating supply chain partners in a unified system is seen as a way to accumulate resources (Rosenzweig *et al.*, 2003; Cousins and Menguec, 2006; Fernie *et al.*, 2010; Yeung *et al.*, 2009). "The rationale behind supply chain integration is to combine partners' resources and perspectives into a firm's value propositions, thus allowing all firms in a supply chain to excel in performance" (Yeung *et al.*, 2009, p66). Lambert and Cooper (2000, p81) concluded that "much friction, and thus waste of valuable resources, results when supply chains are not integrated, appropriately streamlined, and managed". Capitalising on this theoretical rationale, this chapter will move on to obtain an understanding of how firms link together in the supply chain. Hence, the remaining of this chapter will discuss integration in the context of supply chain management and develop a theoretical supply chain integration framework.

3.2 Defining Integration

The Oxford English Dictionary defines the verb integrate as combine (one thing) with another to form a whole. A similar definition of integration in the business environment is provided by Keebler and Durstche (2000, p91) who defined integration as "uniting, combining or incorporation of two or more functions within a company or two or more processes between two or more companies into a compatible or unified process in an operational sense". This definition emphasises that integration is about unifying different processes and can be within and across the firm's boundaries. Integration was also defined by Bagchi and Skjoett-Larsen (2002, p91) as "the quality of the state of collaboration that exists among departments that are required to achieve unity of efforts

by the demands of the environment”. The unity of efforts stated in this definition is at the heart of this thesis discussion of the concept of integration. The accumulation of resources from the different participating units is argued to be the incentive for integration (Cousins and Menguec, 2006; Yeung *et al.*, 2009; Fernie *et al.*, 2010; Schoenherr and Swink, 2012). However, this later definition focuses on the internal firm’s functions (Bagchi and Skjoett-Larsen, 2002) and neglects the interaction outside the firm boundaries. Regardless of whether the focus of integration is internal to the firm or extends beyond its boundaries, integration is portrayed as different units working together as one entity. In the next section, integration will be discussed in the context of supply chain management.

3.3 Defining Supply Chain Integration

The concept of supply chain integration has recently gained widespread attention in supply chain literature (Gimenez *et al.*, 2012; Schoenherr and Swink, 2012; Zhang and Huo, 2013). It is particularly relevant as the complexity of business environment requires firms to work in a more cooperative manner to smooth the flow of information and resources between supply chain partners (Lee, 2000; Mishra *et al.*, 2013; Caridi *et al.*, 2014). Firms are now under increased pressure to integrate their supply chains to become more competitive in order to meet the challenges of current business needs (Danese and Romano, 2011). A number of definitions exist in literature for supply chain integration. Flynn *et al.* (2010, p59) defined supply chain integration as “the degree to which a manufacturer strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organisation processes. The goal is to achieve effective and efficient flow of products and services, information, money and decisions, to provide a maximum value to customer at low cost and high speed”. Kwon and Suh (2005, p26) referred to supply chain integration as “a strategic tool, which attempts to minimise the operating costs and thereby enhancing values for the stakeholders (customers and shareholders) by linking all participating players throughout the system, from supplier’s suppliers to the customers”. These definitions stress that supply chain integration is related to close collaboration and working the different parties as a single entity. However, many scholars agree that the concept of supply chain integration is still not well defined in literature and there is a clear lack of agreement on its constructs (Pagell, 2004; Bagchi and Chun Ha, 2005; Fabbe-Costes and Jahre, 2008; Chen *et al.*, 2009a; Schoenherr and Swink, 2012; Turkulainen and Ketokivi, 2012; Zhang and Huo,

2013). Table 3.1 shows some examples of how the concept of supply chain integration was defined in literature.

Study	Supply Chain Integration Definition
Flynn <i>et al.</i> (2010, p59)	“The degree to which a manufacturer strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organisation processes. The goal is to achieve effective and efficient flow of products and services, information, money and decisions, to provide a maximum value to customer at low cost and high speed”.
Kwon and Suh (2005, p26)	“A strategic tool, which attempts to minimise the operating costs and thereby enhancing values for the stakeholders (customers and shareholders) by linking all participating players throughout the system, from supplier’s suppliers to the customers”
Zhao <i>et al.</i> (2011, p18)	“The degree to which an organisation strategically collaborates with its supply chain partners and manages intra and inter-organisation processes to achieve effective and efficient flows of products, services, information, money and decisions, with the objective of providing maximum value to its customers”
Chen <i>et al.</i> (2009b, p66)	“The management of various sets of activities that aims at seamlessly linking relevant business processes within and across firms and eliminating duplicate or unnecessary parts of the processes for the purpose of building a better-functioning supply chain”.
Wong <i>et al.</i> (2011, p605)	“The strategic collaboration of both intra-organisational and inter-organisational processes”.

Table 3.1: Definitions of supply chain integration

Thus, the importance of precisely defining the concept of supply chain integration and its constructs has been suggested by recent studies (Fabbe-Costes and Jahre, 2008; Chen *et al.*, 2009b; Schoenherr and Swink, 2012; Zhang and Huo, 2013). For example, Fabbe-Costes and Jahre (2008, p131) posited that “... a better understanding of the concept of integration, its dimensions and its implications is of managerial relevance as well as academic importance, and can contribute to theory-building in business logistics, operations and supply chain management”. Before moving on to discuss the levels and components of supply chain integration, the next section will discuss how previous studies viewed the possible outcomes of supply chain integration.

3.4 The Importance of Supply Chain Integration

The predominant belief amongst academics is that supply chain integration has both strategic and operational importance and enables firms to become more competitive (Lambert *et al.*, 1998; Frohlich and Westbrook, 2001; Bagchi and Skjoett-Larsen, 2002; Pagell, 2004; Fabbe-Costes and Jahre, 2008; Van der Vaart and Van Donk, 2008; Yeung *et al.*, 2009). Many studies have found that integration across the supply chain has a positive impact on performance of firms (e.g. Bagchi and Chun Ha, 2005; Zailani and Rajagopal, 2005; Cousins and Menguc, 2006; Kim, 2006; Van der Vaart and Van Donk, 2008; Flynn *et al.*, 2010) whilst others have proved that integration has a positive impact on supply chain performance (Narasimhan and Kim, 2002; Lee *et al.*, 2007) and

operational performance (Frohlich and Westbrook, 2001; Chen *et al.*, 2007; Flynn *et al.*, 2010). Lee (2000) viewed the main benefits of the integrated supply chain in terms of cost reduction, but also an increased value for the focal firm, its shareholders and the supply chain members. Yeung *et al.* (2009, p66) posited that “the rationale behind supply chain integration is to combine partners’ resources and perspectives into a firm’s value propositions, thus allowing all firms in a supply chain to excel in performance”. As supply chain integration involves idiosyncratic investments in the relationship and standardised procedures between a group of firms, according to the resource-based view (RBV), supply chain integration is hard to imitate by competitors (Chen *et al.*, 2009a; Koufteros *et al.*, 2010). When a buyer and supplier work closely in a synchronised way, this leads to acquiring transaction-specific know-how (Grant, 1996; Schoenherr and Swink, 2012; Blome *et al.*, 2014). Such efforts may create a capability that is difficult to replicate by competitors (Rosenzweig *et al.*, 2003; Koufteros *et al.*, 2010; Schoenherr and Swink, 2012) and improve efficiency and coordination (De Vita *et al.*, 2011).

Nevertheless, the validity of integration was questioned by some authors (Cousins and Menguc, 2006; Flynn *et al.*, 2010; Danse, 2011; Danese and Romano, 2011). The empirical findings from Flynn *et al.* (2010) suggested that external supplier integration did not improve operational and business performance. However, their study did not focus on a specific industry and was limited to studying supply chain in the cultural context of China. Their study called for empirical research on supply chain integration from different national and industry contexts. Bask and Juga (2001) argued that intensive integration is not necessarily the best solution in all cases; rather limited integration might be beneficial in some areas. Danese and Romano (2011) analysed the impact of customer integration on efficiency and the moderating role of supplier integration. The study suggested that it is not necessarily that customer integration improves efficiency. However, supplier integration moderates the relationship between customer integration and efficiency. They questioned the feasibility of customer integration in terms of the costs associated with changes in planning to customers’ requirements. Das *et al.* (2006) highlighted some costs related to integrating with suppliers such as the costs of coordination, compromise and inflexibility and found that supplier integration does not necessarily improve performance. Cousins and Menguc (2006, p616) argued that despite the potential benefits of supply chain integration “...it also has costs and may not enhance the supplier’s operational performance”. However, their view of supply chain integration was limited to supplier integration and neglected

the role of internal integration and customer integration. Reviewing a sample of literature related to supply chain management integration and implementation, Power (2005) found that there is a disagreement in previous studies about the expected benefits of integration and the lack of evidence of extensive implementation. A recent study by Gimenez *et al.* (2012, p583) found that “high levels of supply chain integration are only necessary in environments characterised by high supply complexity”. However, their study focused on Small and Medium-sized manufacturers in several industries in the context of Netherlands and Spain and their view of supply chain integration was limited to dyadic integration with customers. Their study considered there that is a need for understanding the interrelationships between the levels of supply chain integration which was not possible in their research as it was limited to customer integration. Hence, the lack of understanding of the interrelationships between the levels of supply chain integration is a gap in extant literature that will be addressed in this research as discussed later in this chapter. Table 3.2 below summarises the key findings from previous supply chain integration studies.

Study	Level of Supply Chain Integration	Underpinning Theory	Method of Inquiry	Unit of Data Collection (Source of Evidence)	Context	Key Findings
Flynn <i>et al.</i> (2010)	Internal integration Supplier integration Customer integration	Configuration theory Contingency theory	Survey of several industries	Manufacturers (Single respondent)	China	Customer integration and internal integration supported performance. However, supplier integration did not support performance.
Pagell (2004)	Internal integration	None	Multiple-case study of various industries	Manufacturing companies (Interviews and direct observation)	USA	Internal integration is a complex phenomenon driven by a number of factors including the internal structure and culture, reward systems and the amount of formal and informal communication across the functions.
Rai <i>et al.</i> (2006)	Supply chain integration (in general)	None	Survey	Manufacturers or retailers (Single respondent)	USA	Information technology capabilities improve supply chain integration and supports information integration and physical integration.
Schoenherr and Swink (2012)	Internal integration Supplier integration Customer integration	Relational view Resource-based view Information processing	Survey of various industries	Various industries (Single respondent)	North America, Asia-pacific and Europe	Internal integration supported external integration. Both supplier and customer integration are important for improved supply chain integration.
Rosenzweig <i>et al.</i> (2003)	Supply chain integration (in general)	Information processing Knowledge-based view Transaction-cost	Survey of several manufacturing sectors	Manufacturers (Single respondent)	North America, Latin America Asia-pacific and Europe	Supply chain integration intensity leads directly to improved business performance.
Gimenez and Ventura (2005)	Logistics-production, Logistics-marketing External customer	None	Survey of FMCG manufacturing companies	Manufacturers (Single respondent)	China	Dyadic integration of logistics-marketing did not improve operational performance. However, performance between logistics and production was improved in the presence of customer integration.
Zhao <i>et al.</i> (2011)	Internal integration Supplier integration Customer integration	None	Survey of several manufacturing companies.	Manufacturers (Single respondent)	China	Internal integration impacts both supplier and customer integration. Commitment to customers/suppliers is important for achieving customer integration/supplier integration.
Das <i>et al.</i> (2006)	Supplier integration	Resource-based view, Transaction-cost Institutional isomorphism	Survey of manufacturing companies in various sectors.	Manufacturers (Multiple respondents)	USA	Supplier integration does not necessarily improve performance.

Study	Level of Supply Chain Integration	Underpinning Theory	Method of Inquiry	Unit of Data Collection (Source of Evidence)	Context	Key Findings
Koufteros <i>et al.</i> (2010)	Internal integration Supplier integration Customer integration	None	Survey of automotive industry producers of parts and components	Producers (Single respondent)	USA	Internal integration is important for both supplier and customer integration. Customer integration influences market success. Supplier integration influences operational performance.
Deveraj <i>et al.</i> (2007)	Supplier integration Customer integration	Relational view Resource-based view	Survey of various industries	Manufacturers (Single respondent)	USA	Customer integration did not improve operational performance but supplier integration improved performance.
Basnet and Wisner (2012)	Internal integration	None	Survey of large manufacturing firms	Manufacturers (Single respondent)	New Zealand	Line managers are able to improve functional integration by fostering a positive attitude towards other departments. Integration is enhanced by making departments jointly accountable for achieving company goals.
Frohlich and Westbrook (2001)	Supplier integration Customer integration	None	Survey of manufacturing companies	Manufacturers (N.A)	Several countries	The higher the integration with both supplier and customer, the higher the performance.
Cousins and Menguc (2006)	Supplier integration	Socialisation theory	Survey of various manufacturing and service companies	The focal company (single respondent)	UK	Supply chain integration improved supplier's communication. However, it did not support supplier's performance.
Wong <i>et al.</i> (2011)	Internal integration Supplier integration Customer integration	Information processing Contingency theory	Survey of manufacturers in the automotive industry	Manufacturers (Single respondent)	Thailand	Under the environmental uncertainty the relationships between supplier/customer integration, and delivery and flexibility performance, and those between internal integration, and product quality and production cost are high.
Gimenez <i>et al.</i> (2012)	Customer integration	None	Survey of manufacturers in several industries	Manufacturers (Single respondent)	Spain and Netherlands	Supply chain integration increases performance only if supply complexity is high
Zhang and Huo <i>et al.</i> (2013)	Supplier integration Customer integration	Resource-dependence Resource-based view Transaction-cost	Survey of manufacturers in several industries	Manufacturers (Single respondent)	China	Both supplier and customer integration improves financial performance. Trust and dependence combined together influence supply chain integration

Table 3.2: A summary of previous studies of supply chain integration

Flynn *et al.* (2010) attributed the inconsistency of empirical findings about the impact of supply chain integration on performance to the lack of a comprehensive definition of the concept. Particularly, they attributed this to restricting its definition to supplier and customer integration and overlooking the importance of internal company integration. Turkulainen and Ketokivi (2012, p448) stated that “research on integration is voluminous, but at the same time, empirical results are inconclusive and at times, contradictory”. They argued that the theoretical basis of integration is still fragmented. The fundamental reason is that “integration has been conceptualised, defined, and operationalised in drastically different ways...” (Turkulainen and Ketokivi, 2012, p449). Fabbe-Costes and Jahre (2008) suggested that the lack of literature of a universal definition of the concept of integration and understanding of its implementations has resulted in producing varying results. The lack of agreement on the level and components of integration has led researchers to flexibly define the concept and, to a large extent, introduce varying constructs (Flynn *et al.*, 2010; Wong *et al.*, 2011). It is suggested therefore that a clear definition of supply chain integration and its constructs need to be provided prior to carrying out the empirical investigation. This weakness in the literature is addressed in this thesis through developing a comprehensive theoretical supply chain integration framework and providing a detailed description of its constructs.

Two main issues are important and will be considered to classify previous studies on supply chain integration. These are ‘integration level’ and ‘integration component’. The ‘integration level’ will be used to denote whether the integration is internal or external to the firm. The ‘integration component’ will be used to denote the elements that should be included in the integrated supply chain. The combination of both ‘integration level’ and ‘integration component’ is referred to as ‘construct’. Thus, this thesis will now discuss supply chain integration at both internal and external levels together with the integration components constituting the constructs that need to be included in the supply chain integration framework.

3.5 Levels and Components of Supply Chain Integration

Supply chain integration has been studied in literature at two broad levels; external integration and internal company integration. While external integration examines integration that occurs between the firm and its suppliers and customers (Schoenherr and Swink, 2012), internal company integration is associated with the integration of the

production and supporting functions within the organisation (Pagell, 2004). Each level of supply chain integration is discussed in detail.

3.5.1 External Supplier and Customer Integration

External integration refers to the integration of the company with its external environment including customers and suppliers. Referring to Stank *et al.* (2001), Flynn *et al.* (2010, p59) defined external integration as “the degree to which a manufacturer partners with its external partners to structure inter-organisational strategies, practices and process into collaborative, synchronised processes”. The literature has studied external integration from different perspectives. One stream of research studied external integration in terms of integration of the focal company with its customers (e.g. Stank *et al.*, 2001; Germain and Iyer, 2006; Zhao *et al.*, 2008). Another stream studied external integration in terms of supplier integration (e.g. Ragatz *et al.*, 1997; Das *et al.*, 2006; Cousins and Menguc, 2006; Perols *et al.*, 2013). A third stream studied external integration in terms of both customer and supplier integration (e.g. Frohlich and Westbrook, 2001; Narasimhan and Kim, 2002; Devaraj *et al.*, 2007; Koufteros *et al.*, 2010; Wong *et al.*, 2011; Zhao *et al.*, 2011; Schoenherr and Swink, 2012; Prajogo and Olhager, 2012). Some other studies (e.g. Frohlich and Westbrook, 2001; Chen *et al.*, 2009b) investigated external integration with supply chain partners in general and did not differentiate between suppliers and customers. In this thesis external integration will be viewed in terms of integrating with both suppliers and customers.

Several studies found a positive relationship between external integration and organisational performance (e.g. Stank *et al.*, 2001; Frohlich and Westbrook, 2001; Schoenherr and Swink, 2012). Stank *et al.* (2001) found that customer integration positively impacted on the firm performance. Ragatz *et al.* (1997) found that external integration represented by suppliers’ integration into product value/supply chains is essential for manufacturers to achieve improvements that maintain their competitiveness. The seminal work of Frohlich and Westbrook (2001) describing the ‘arcs of integration’ introduced five classifications for the manufacturer’s degree of downstream and upstream integration in the supply chain. Their study’s findings suggested that the greater the degree of integration with the downstream customers and upstream suppliers the better is the performance improvement. Reinforcing the importance of external integration with both customers and suppliers, Frohlich and Westbrook (2001, p185) stated that “the most successful manufacturers seem to be those that have carefully linked their internal processes to external suppliers and

customers in unique supply chains”. Their study was recently revisited by Schoenherr and Swink (2012) who also reinforced the importance of integrating with suppliers and customers for improved operational performance. However, the study of Schoenherr and Swink (2012) suggested that future research on integration needs to introduce empirical evidence in other contexts.

External integration has been studied in literature based on different components. Frohlich and Westbrook (2001) used the forward and backward integration to measure integration. Bagchi and Skjoett-Larsen (2002) viewed supply chain integration in terms of information technology integration and relationships integration. Power (2005) classified integration into material flow, information flow and inter-relationships. The main components used by previous literature explicitly (e.g. Prajogo and Olhager, 2012) or implicitly (e.g. Das *et al.*, 2006) in studying external integration are summarised in Table 3.3. These studies have been compared against five major components including information integration, material integration, financial integration, technological integration and actors’ integration. These five components emerged from the discussion of supply chain relationships and coordination, and were found to be implied in most previous research on supply chain integration.

Study	Information Integration	Material Integration	Financial Integration	Technological Integration	Actors Integration
Frohlich and Westbrook (2001)	x	x			
Cousins and Menguc (2006)	x	x			x
Zolait <i>et al.</i> (2010)	x	x	x		
Chen <i>et al.</i> (2009b)	x	x		x	
Power (2005)	x	x			x
Bagchi and Skjoett-Larsen (2002)	x			x	x
Bagchi and Ha (2005)					x
Das <i>et al.</i> (2006)	x		x	x	
Germain and Iyer (2006)	x	x		x	x
Devaraj <i>et al.</i> (2007)				x	
Rai <i>et al.</i> (2006)	x	x	x	x	
Stock <i>et al.</i> (2000)	x	x		x	x
Prajogo and Olhager (2012)	x	x		x	x
Flynn <i>et al.</i> (2010)	x				x
Danese and Romano (2011)	x			x	x
Zhao <i>et al.</i> (2011)	x				x
Vickery <i>et al.</i> (2003)	x			x	x
Campbell and Sankaran (2005)	x	x		x	x
Stank <i>et al.</i> (2001)	x	x	x	x	x
Schoenherr and Swink (2012)	x	x			x

Table 3.3: A summary of the main components used by previous literature (explicitly or implicitly) in studying supply chain external integration

According to Table 3.3, information integration seems to be the most widely used component for studying external integration. Moreover, material, technological and actors' relationships integration are also popular components for studying external supply chain integration. However, financial integration appears to be less important than the other components in studying supply chain external integration. Hence, external financial integration is outside the scope of this thesis and therefore, will not be constructed in the theoretical supply chain integration framework. The major components of external supplier and customer integration that will be constructed in the theoretical framework are now discussed in detail.

- **External Supplier and Customer Actors' Integration**

External actors' integration relates to building close and long-term relationships based on mutual understanding between the supply chain suppliers and customers. Such integration will pave the way for information and material flows to be continued and successfully implemented (Prajogo and Olhager, 2012; Schoenherr and Swink, 2012). Flynn *et al.* (2010) suggested that mutual understanding needs to be considered in future research on supply chain integration. Inter-organisational relationships play an essential role in supply chain integration (Chen and Paulraj, 2004b; Kwon and Suh, 2005; Zhao *et al.*, 2008; Zhao *et al.*, 2011; Prajogo and Olhager, 2012). Long-term relationships through sharing of responsibilities, common planning (Min *et al.*, 2005), dedicated investments and joint relationship efforts (Nyaga *et al.*, 2010) are needed for a successful implementation of supply chain integration (Prajogo and Olhager, 2012). The long-term relationship based on planning and sharing knowledge and resources enable firms to be in a position of generating a competitive advantage (Dyer and Singh, 1998; Hoyt and Huq, 2000; Blome *et al.*, 2014). Literature emphasised also the importance of high level of interdependence and mutual objectives between the partnering organisations (Mohr and Spekman, 1994; Maloni and Benton, 1997; Zhang and Huo, 2013). Cousins and Menguc (2006) argued that linking with suppliers through socialisation is viewed as a strategic resource that can positively affect both supplier communication and supplier operational performance. Through long-term relationships organisations are able to overcome uncertainty in turbulent business environments and deliver products more efficiently (Hines and McGowan, 2005; Towers and Burnes, 2008). As supply chain integration involves coordination and collaboration between trading partners, firms need to show willingness to continue in integrating with their

supply chain partners (Zhao *et al.*, 2011). The belief that supply chain partners will dedicate resources to sustain a relationship is essential for the development of long-term relationships (Spekman *et al.*, 1998). Chen and Paulraj (2004b, p141) stated that “with commitment, supply chain partners become integrated into their major customers’ processes and more tied to their goals”. Zhao *et al.* (2008) found that the committed relationship to customers has a direct impact on improving customer integration in the supply chain. A later study by Zhao *et al.* (2011) found that long-term relationships with both customers and suppliers are important to external integration between trading partners. They argued that “before external integration can be successfully implemented, organisations must have a willingness to integrate with external supply chain partners” (Zhao *et al.*, 2011, p17). Fawcett *et al.* (2009) stressed the importance of willingness that is built based on mutual understanding for information sharing at both intra- and inter-firm levels. When the willingness to share information is embedded in the organisational culture of the firm, a rare resource is created that might produce a competitive advantage. Similarly, the ability of supply chain actors to show willingness to share information is a resource that can lead to a sustainable competitive advantage (Fawcett *et al.*, 2009). When mutual understanding exists in a supply chain relationship, it can be viewed as a scarce resource which is according to RBV can generate a competitive advantage (Lorenzoni and Lipparini, 1999; Barratt and Oke, 2007; Zhao *et al.*, 2011). In fact, the idiosyncratic nature of firm relationships with the supply chain actors makes imitability difficult (Lorenzoni and Lipparini, 1999).

Supply chain partners tend to have different and conflicting interests and objectives (Wang and Chan, 2010). Hence, long-term relationships cannot be achieved unless the supply chain partners feel that there is mutual understanding in the relationship (Kwon and Suh, 2005; Zhang and Huo, 2013). Supply chain members who achieved mutual understanding will have a higher degree of satisfaction with their relationship and will dedicate resources to ensure its continuity (Barratt and Oke, 2007; Towers and Burnes, 2008; Nyaga *et al.*, 2010). In order for firms to be integrated in their supply chains, mutual understanding and the willingness to maintain the relationship become essential (Flynn *et al.*, 2010). Thus, mutual understanding and long-term relationships are essential elements of successful supply chain integration (Lee *et al.*, 1997; Kwon and Suh, 2005; Chen *et al.*, 2009a).

Based on the previous discussion, external actors’ integration that is based on long-term relationships and mutual understanding will be constructed in the theoretical supply

chain integration framework. Hence, external information integration that appreciates the importance of sharing high quality information between the supply chain members will be constructed in the theoretical framework.

- **External Supplier and Customer Information Integration**

Information integration involves the coordination of information flow across the supply chain. Much literature has studied integration in terms of information flow (Lee *et al.*, 1997; Lee *et al.*, 2000; Zhao *et al.*, 2002; Williams *et al.*, 2013). According to Bagchi and Skjoett-Larsen (2002, p91) information integration “permits management to examine the operations of the organisation in totality and not in a fragmented, functionally isolated manner”. Rai *et al.* (2006, p230) defined information integration as “the extent to which operational, tactical, and strategic information are shared between a focal firm and its supply chain partners”. They consider that the indicators of information integration include information sharing related to demand, sales, production schedules, delivery schedules and performance metrics. This definition clearly states the importance of information sharing between supply chain members which should ultimately lead to a more effective supply chain. Bagchi and Skjoett-Larsen (2002, p91) introduced a more straightforward definition to information integration as “the sharing of information and knowledge among the members in the supply chain, including sales forecasts, production plans, inventory status and promotion plan”. One criticism of these two definitions is that they do not state the purpose of information sharing in the supply chain but rather they emphasise the need for information to be shared extensively across the supply chain. Table 3.4 below shows the definitions of information integration in literature.

Study	Information Integration Definition
Parjogo and Olhager (2012)	The sharing of key information across the supply chain through information technology.
Rai <i>et al.</i> (2006)	The extent to which the focal company exchanges information with its supply chain partners.
Bagchi and Skjoett-Larsen (2002, p91)	“The sharing of information and knowledge among the members in the supply chain, including sales forecasts, production plans, inventory status and promotion plan”

Table 3.4: Definitions of information integration

Another essential term that is associated with information sharing and information integration is information visibility. Barratt and Oke (2007) explained the relationship between ‘visibility’ and ‘information sharing’ and posited that information visibility is an outcome of the activity of information sharing. High visibility can be achieved “...

through extensive sharing of useful and meaningful information amongst different players within the supply chain” (Barratt and Oke, 2007, p1220). In turn, this visibility should improve decision-making and lead to a more effective supply chain (Barratt and Oke, 2007; Wei and Wang, 2009; Williams *et al.*, 2013; Caridi *et al.*, 2014). Thus, information visibility across the supply chain is an indicator of information integration (Patnayakuni *et al.*, 2006) as information integration creates visibility of inventory and production across the supply chain (Bagchi and Skjoett-Larsen, 2002). Table 3.5 below shows the definitions of supply chain visibility in literature.

Study	Supply Chain Visibility Definition
Barratt and Oke (2007)	The extent to which the supply chain members share and have access to key and useful information that is timely, trustworthy, accurate and easy-to-use.
Caridi <i>et al.</i> (2014)	The extent to which the focal company is able to access and share the operational and strategic information in the supply chain.
Kim <i>et al.</i> (2011)	The degree to which the supply chain members have access to information related to control and planning of the supply chain.
Kaipia and Hartiala (2006)	The sharing of relevant and meaningful information between the supply chain members and echelon in the chain.
Caridi <i>et al.</i> (2010)	The intensive sharing of ‘accurate’ and ‘fresh’ information in the supply chain

Table 3.5: Definitions of supply chain visibility

A recent study by Williams *et al.* (2013) suggested that visibility is an outcome of external integration. However, their view of external integration was limited to information sharing and neglected the other elements of material and supply chain members’ relationships. The importance of gaining information visibility across the supply chain for firms is well supported in literature (Barratt and Oke, 2007; Patnayakuni *et al.*, 2006; Lee, 2007; Caridi *et al.*, 2014). Supply chain visibility is defined by Barratt and Oke (2007, p1218) as “the extent to which actors within a supply chain have access to or share information which they consider as key or useful to their operations and which they consider will be of mutual benefit” (Barratt and Oke, 2007, p1218). Barratt and Oke (2007) stressed the importance of sharing useful and meaningful information in order for visibility to produce a sustainable competitive advantage. According to RBV, the high level of visibility can be seen as a capability that is a potential source of competitive advantage (Barratt and Oke, 2007). Information shared between supply chain members needs to enjoy qualities including being trustworthy, timely, meaningful and accurate (Barratt and Oke, 2007; Porasmaa and Ojala, 2011; Williams *et al.*, 2013; Caridi *et al.*, 2014) in order to produce visibility for the supply chain members. To create visibility, trading firms should not only make sure that

information is available and shared; they should also ensure the accuracy, trustworthiness and usefulness of this information (Barratt and Oke, 2007). The need for considering the quality of shared information is not new in literature. The rationale for focusing on the quality of information shared is to ensure that the trading partners have access to the same information that is meaningful and can be used for improved decision making. Literature supported also the role of inter-organisational information sharing systems in facilitating information visibility in the supply chain (e.g. Kim *et al.*, 2011). Another stream of literature considered the role of close relationships between the trading members in order to produce higher levels of visibility (e.g. Barratt and Oke, 2007; Kocoglu *et al.*, 2011). The argument is that the increased levels of integration between the actors based on mutual understanding facilitate producing higher visibility (Barratt and Oke, 2007).

- **External Supplier and Customer Material Integration**

It is essential that supply chain actors be linked together in a way that improves the efficient distribution of material (Daugherty *et al.*, 1996). Material integration plays a key role in achieving supply chain integration (Stock *et al.*, 2000; Stank *et al.*, 2001; Rai *et al.*, 2006; Prajogo and Olhager, 2012). Material integration was defined by Stock *et al.* (2000, p535) as “specific logistics practices – operational activities that coordinate the flow of materials from suppliers to customers throughout the value stream”. This definition puts emphasis on the coordination of material between trading partners. Rai *et al.* (2006, p230) referred to material integration as “the degree to which a focal firm uses global optimisation with its supply chain partners to manage the stocking and flow of materials and finished goods”. This definition emphasises the standardisation of material flow procedures and the use of common initiatives by supply chain actors in order to optimise the material flow. These two definitions put emphasis on the material flow between the external members of the supply chain. The importance of the efficient and effective material flow across the firm boundaries has increased as a result of the increased cooperative agreements and strategic partnerships between firms. External material emphasises that the “logistics activities of a firm are integrated with the logistics activities of its suppliers and customers” (Stock *et al.*, 2000, p536). External material integration needs to be achieved across the firm boundaries through linking the various supply chain players (Chen and Paulraj, 2004a). External material integration is characterised by increased information sharing systems and communication tools

integration with the supply chain members (Chen and Paulraj, 2004a; Kim *et al.*, 2011; Mishra *et al.*, 2013), higher coordination of logistics activities and the standardisation of the logistics activities of the supply chain partners (Chen and Paulraj, 2004a; Stock *et al.*, 2000). Literature reported benefits for material integration in terms of shorter lead time, reduced costs, improved sales and service level (Prajogo and Olhager, 2012). Furthermore, material integration is proved to be an important tool for manufacturers to smooth the production process and produce a seamless connection between supply chain partners (Prajogo and Olhager, 2012). Ellinger *et al.* (1997) found a strong linkage between material integration and customer service. Larson (1994) reported a clear relationship between material integration, total cost reductions and improving the firm's profitability. Another strategic benefit for material integration is reported by Geary *et al.* (2006) who argued that smooth material flow leads to mitigate the effect of the bullwhip phenomenon in supply chains. A well-coordinated flow of material enables firms to deliver products to end customers in a timely, efficient and effective way. Firms have implemented several practices and initiatives for synchronising the flow of material with their suppliers and customers (Daugherty *et al.*, 1996; Pagh and Cooper, 1998; Yao *et al.*, 2007; Saldanha *et al.*, 2013). For example, through supplier's participation in managing customer's inventory firms have gained advantages in reducing the possibility of stock shortage and overage and improving forecasting (Yao *et al.*, 2007; Saldanha *et al.*, 2013; Lee and Cho, 2014). Relationships between the supply chain members are necessary for facilitating the efficient material flow as shown by the empirical findings from Prajogo and Olhager (2012). Drawing on RBV rationale, this thesis argues that external material integration can be seen as capabilities for the firm (Chen *et al.*, 2009a) that can be viewed as connections which would be a source of competitive advantage for the firm (Rungtusanatham *et al.*, 2003). Capitalising on this discussion; it is stressed that material integration between supply chain members leads to improve the firm's long-term competitiveness and growth (Rai *et al.*, 2006; Prajogo and Olhager, 2012). Hence, external material integration will be constructed in the theoretical supply chain integration framework.

- **External Supplier and Customer Technological Integration**

Technological integration has often been viewed in literature in terms of information systems integration (Vickery *et al.*, 2003; Gunasekaran and Ngai, 2004; Rai *et al.*, 2006; Harland *et al.*, 2007). The integration of information technology facilitates the flow of

information between the different departments within the firm but also between firms occupying different positions across the supply chain (Vickery *et al.*, 2003). Rai *et al.* (2006, p231) used a broader term to describe supply chain technological integration. They referred to this as 'IT infrastructure integration' and defined it as "the degree to which a focal firm has established IT capabilities for the consistent and high-velocity transfer of supply chain-related information within and across its boundaries". This definition explains the importance of having synchronised information systems between supply chain partners. Prajogo and Olhager (2012) argued that IT integration is a key element for having a successful logistics integration and information integration. Bagchi and Skjoett-Larsen (2002) referred to the different types of technologies that provide real-time information such as electronic data interchange (EDI) systems as communication infrastructure. They stated that "a reliable communication infrastructure paves the way for timely and efficient information exchange among partners" (Bagchi and Skjoett-Larsen, 2002, p91). On the other hand, the fragmented IT infrastructure can negatively affect the coordination of information flows between firms (Rai *et al.*, 2006). Rai *et al.* (2006) suggested that technological integration consists of two basic components being data consistency and cross-functional supply chain management application systems integration. Data consistency refers to "the degree to which common data definitions and consistency in stored data have been established across a focal firm's supply chain" (Rai *et al.*, 2006, p231). This clearly emphasises the importance of developing common terms for the data storage systems. Cross-functional supply chain management application systems integration refers to the degree of real-time communication of the firm function-specific supply chain management applications with each other and related information systems applications. This is related to the integration of supply chain applications rather than the contents of information shared (Rai *et al.*, 2006). Technological integration represents an essential element of supply chain integration as it facilitates logistics integration, information integration and financial integration. Firms who are technologically integrated are building long-term investments in their supply chain relationships. The empirical research from Barratt and Oke (2007) and Barratt and Barratt (2012) showed that the information shared with suppliers via communication tools such as email and fax provided operational improvements. However, they concluded that these tools did not facilitate the sharing of information that would produce high visibility. Previous studies (e.g. Frohlich and Westbrook, 2002; Rosenzweig *et al.*, 2003; Paulraj *et al.*, 2008) suggested that the internet-based applications are vital for the integration with external

partners. However, these applications do not produce a real-time access to information and high visibility (Barratt and Barratt, 2012; Saldanha *et al.*, 2013). Thus, they are unlikely to generate competitive advantage because such communication tools do not fulfil the criteria of VRIN of the RBV (Paulraj *et al.*, 2008). From an RBV perspective, technological integration can be seen as specific-assets that are difficult to imitate and can generate capabilities that are a source of competitive advantage (Barney, 1991; De Vita *et al.*, 2011). Although building technologies is imitable by competitors (Wu *et al.*, 2006), technology that is supported with willingness to share high quality information is seen as a hard to replicate capability (Barratt and Oke, 2007; Paulraj *et al.*, 2008; Fawcett *et al.*, 2009). Paulraj *et al.* (2008) found that the mere investment in IT does not produce competitive advantage. Rather, it needs to be coupled with effective communication and close relationships between the buyer firms and their suppliers. Hence, external technological integration will be constructed in the theoretical framework.

The success in achieving external integration has often been linked in recent literature to achieving integration internally amongst the production and supporting functions (Wong *et al.*, 2011; Zhao *et al.*, 2011; Schoenherr and Swink, 2012). Having discussed external supplier and customer integration, attention is now turned on introducing internal company integration as a key component of supply chain integration.

3.5.2 Internal Company Integration

The original view of supply chains has an intra-organisational focus and is concentrated primarily on the integration of internal functions of the firm to smooth the flow of material between the production and supporting functions (Harland, 1996; Koufteros *et al.*, 2010) and gain a competitive advantage (Zhao *et al.*, 2011). The scope of supply chain management has broadened over time to be focused on more complex inter-organisational issues (Chen and Paulraj, 2004b; Zhao *et al.*, 2011). Internal company integration refers to breaking down the functional barriers and working with the different divisions within the organisation as a single unit. The organisation functional divisions are viewed as an integrated process rather than functional silos based on traditional departmentalisation and specialisation (Flynn *et al.*, 2010). Operating as a single process requires shared information, joint-planning and cross functional teams in order to remove functional barriers between departments and increase the cooperation to achieve the ultimate goal of meeting customers' requirements. Stank *et al.* (2001, p33)

referred to internal company integration as “the competency of linking internally performed work into a seamless process to support customer’s requirements”. Pagell (2004, p460) defined internal company integration as “a process of interaction and collaboration in which manufacturing, purchasing and logistics work together in a cooperative manner to arrive at mutually acceptable outcomes for their organisation”. It was also defined by Schoenherr and Swink (2012, p100) as “cross-functional intra-firm collaboration and information sharing activities that occur via interconnected and synchronised processes and systems”. Chen and Paulraj (2004b, p142) defined internal company integration as “the degree to which firms are able to integrate and collaborate across traditional functional boundaries to provide better customer service”. Yeung *et al.* (2009, p68) introduced a broader definition of internal company integration that includes organisational strategies, practices, procedures and behaviours. Their definition reads “the degree to which a firm can structure its organisational strategies, practices, procedures and behaviours into collaborative, synchronised and manageable processes in order to fulfil customer requirements”. Internal company integration involves information sharing between the internal functions through information system integration and cross-functional cooperation (Zhao *et al.*, 2011).

Bowersox *et al.* (1999) suggested that internal company integration comprises cross-functional unification, standardisation, simplifications, compliance and structural adaptation. Stevens (1989) viewed internal company integration in terms of managing materials manufacturing and distribution. Similarly, Rosenzweig *et al.* (2003) viewed internal company integration in terms of source, make, and deliver processes within the company. They argued that internal company integration occurs when the departments who perform these three processes are integrated. Table 3.6 gives a fuller picture of the main components used by previous literature in studying internal company integration. These studies have been compared against the same components used in external integration. These are information integration, material integration, financial integration, technological integration and actors’ integration.

Study	Information Integration	Material Integration	Financial Integration	Technological Integration	Actors Integration
Germain and Iyer (2006)	x				x
Lee <i>et al.</i> (2007)	x	x		x	
Narasimhan and Kim (2002)	x	x		x	x
Pagell (2004)	x	x		x	x
Flynn <i>et al.</i> (2010)	x	x		x	x
Zhao <i>et al.</i> (2011)	x	x		x	x
Rosenzweig <i>et al.</i> (2003)	x				x
Stank <i>et al.</i> (2001)	x	x	x	x	x
Chen and Paulraj (2004b)	x	x			x
Yeung <i>et al.</i> (2009)	x	x		x	x
Vickery <i>et al.</i> (2003)					x
Stock <i>et al.</i> (2000)	x	x		x	x
Bowersox <i>et al.</i> (1999)	x	x			x
Gimenez and Ventura (2005)	x	x			x
Basnet and Wisner (2012)	x	x		x	x
Schoenherr and Swink (2012)	x	x			x

Table 3.6: A summary of the main components used by previous literature (explicitly or implicitly) in studying internal company integration

According to Table 3.6, information integration seems to be the most widely used component for studying internal company integration. Material integration, technological integration and actors' integration are also popular components for studying internal supply chain integration. Financial integration appears to be less important than the other components in studying supply chain internal integration. Hence, internal financial integration is outside the scope of this thesis and therefore, will not be constructed in the theoretical supply chain integration framework. The major components of internal company integration that will be constructed in the theoretical framework are now discussed in detail.

- **Internal Actors' Integration**

Internal actors' integration is represented by collaboration through cross-functional teams, joint planning and sharing goals among the production and supporting functions within the firm. Internal actors' integration involves that the different departments work together through information sharing and adopting common vision and shared goals (Kahn and Mentzer, 1998; Pagell, 2004; Basnet and Wisner, 2012).

The coordination through cross-functional teams is the most widely cited indicator of internal company integration in literature (Vickery *et al.*, 2003; Chen *et al.*, 2009a). “Cross-functional teams are typically employed to achieve the integration needed across internal functions to ensure that quality or innovation objectives are realised” (Vickery *et al.*, 2003, p526). Improving the work efficiency and mitigating redundancies can be achieved through synchronising the work of the different departments (Grant, 1991; Chen *et al.*, 2009a). The degree to which each department’s success depends on the success of other departments within the firm is also relevant to internal actors’ integration (Rungtusanatham *et al.*, 2003; Wong *et al.*, 2011; Basnet and Wisner, 2012). Linking the different departments within the firm through regular interaction is essential to facilitate the flow of information and material (Rungtusanatham *et al.*, 2003; Barratt and Barratt, 2012). Sharing internal goals and coordination through cross-functional teams can be viewed as a socially complex resource (Wernerfelt, 1984; Barney, 1991). Such resource, according to the RBV theory, is not easily imitable or traded (Wernerfelt, 1984; Barney, 1991; Rungtusanatham *et al.*, 2003) which makes it a potential of generating a competitive advantage for the firm (Barney, 1991). Sharing of internal specific-knowledge that cannot be easily imitated is also seen as a source of competitive advantage (Grant, 1996; Tsai, 2002; Hult *et al.*, 2006; Blome *et al.*, 2014). Hence, internal actors’ integration that appreciates the importance of joint planning and shared goals and coordination through cross-functional teams will be constructed in the theoretical supply chain integration framework.

- **Internal Information Integration**

Information integration will be also considered in this research at the internal level. Internal information integration will be defined based on Rai *et al.* (2006), Barratt and Barratt (2012) and Rungtusanatham *et al.* (2003). Hence, the thesis definition of internal information integration refers to the degree to which the internal production and supporting functions share high quality information that produces internal visibility. Barratt and Barratt (2012) argued that internal information integration improves visibility and operational performance. Previous studies suggested that information sharing produced a higher level of visibility when supported by close relationships amongst the production and supporting functions (Kocoglu *et al.*, 2011; Barratt and Barratt, 2012) and that the company culture has an influence on the benefits gained

from the internal information integration (Fawcett *et al.*, 2009). Internal information integration involves frequent personal interaction (Pagell, 2004) and real-time information sharing (Yeung *et al.*, 2009; Mishra *et al.*, 2013). Pagell (2004) argued that internal information sharing systems need to be supported by close coordination between the production and supporting functions within the firm in order to produce higher levels of internal information integration. Such information integration is necessary to achieve the company's goals (Kahn and Mentzer, 1998) and facilitate the flow of material (Frohlich and Westbrook, 2001; Prajogo and Olhager, 2012). Information integration amongst the internal functional departments can create capabilities that are potential sources of competitive advantage for the firm (Lorenzoni and Lipparini, 1999; Rungtusanatham *et al.*, 2003; Chen *et al.*, 2009a). Hence, internal information integration that appreciates the importance of sharing high quality information amongst the production and supporting functions will be constructed in the theoretical supply chain integration framework.

Both internal and external information integration will be constructed in the theoretical supply chain integration framework.

- **Internal Material Integration**

Material integration is also applied within the organisation. The empirical findings from Gimenez and Ventura (2005) suggested that the internal integration between the production and logistics departments reduced the stock-outs level in the presence of external customer integration. However, their study focused on fast-moving consumer goods (FMCG) in the context of Spain and they studied internal company integration in terms of dyadic interface. The scope of material integration includes also the elements of raw materials and finished goods flow between the production and supporting functions (Ballou *et al.*, 2000; Pagell, 2004; Flynn *et al.*, 2010). Internal material integration can be portrayed in terms of implementing standardised procedures for managing the material flow among the functional departments (Chen and Paulraj, 2004b). Mishra *et al.* (2013) and Caridi *et al.* (2014) found that the close coordination of activities and information sharing resulted in improved inventory control for the firm. Therefore, the focus now is on integrating all the material flow between the functional departments as well as the supply chain partners (Flynn *et al.*, 2010).

Material integration is relevant to the firm's resource allocation and utilisation but also gaining a competitive market position (Chen *et al.*, 2009a). Drawing on RBV rationale, this thesis argues that internal material integration can be seen as capabilities (Chen *et al.*, 2009a) that can be viewed as connections which would be a source of competitive advantage for the firm (Rungtusanatham *et al.*, 2003). These capabilities may result from the experiences that develop over time which would create idiosyncratic history that is not easy to duplicate by competitors (Hult *et al.*, 2006). The accumulation of transaction-specific routines (Grant, 1996) represented by material integration may result in a core competence that improves internal efficiency and coordination (De Vita *et al.*, 2011). Such integration "can create combinations of unique skills, knowledge, and joint capabilities" (Schoenherr and Swink, 2012, p101). Hence, internal material integration will be constructed in the theoretical supply chain integration framework.

- **Internal Technological Integration**

While the discussion above focused on technological integration at the inter-organisational level, technological integration is the basis for linking the different functional departments within the firm (Pagell, 2004; Gunasekaran and Ngai, 2004). IT allows a seamless linkage between production and supporting functions (Arshinder *et al.*, 2008). This has often been achieved through Enterprise Resource Planning (ERP) systems (Pagell, 2004; Rai *et al.*, 2006; Barratt and Barratt, 2012). The theory of internal company integration suggests that the use of technology for information sharing amongst the internal departments is essential (Rosenzweig *et al.*, 2003; Pagell, 2004; Rai *et al.*, 2006; Arshinder *et al.*, 2008). Several authors suggested that internal technological integration facilitated the real-time access to information and improved internal visibility (Kim *et al.*, 2011; Barratt and Barratt, 2012; Mishra *et al.*, 2013). However, this is inconsistent with the research from Basnet and Wisner (2012) who found that an enterprise-wide technology for information sharing was not related to achieving internal company integration. This contradiction makes investigating the relevance of technological integration of importance to the development of supply chain integration.

Supply chain integration requires idiosyncratic investments that are embedded in a relationship (Chen *et al.*, 2009a; Koufteros *et al.*, 2010). Some studies found that information sharing technology in itself would not produce performance improvements that lead to competitive advantage (Barratt and Barratt, 2012; Paulraj *et al.*, 2008; Fawcett *et al.*, 2009; Prajogo and Olhager, 2012; Saldanha *et al.*, 2013; Mishra *et al.*,

2013). For instance, Fawcett *et al.* (2009) found that the information sharing technology needs to be combined with a willingness to make the information available by the supply chain partners in order to produce improved performance.

Although technological integration and information integration are closely related concepts and many previous studies combined them in a single construct, technological integration will be constructed in the theoretical framework in order to understand the potential capabilities that could be achieved through this component of integration. A recent study by Williams *et al.* (2013) has called for the importance of technological integration to be investigated as a means to increase firm capabilities. Hence, internal and external technological integration will be constructed in the theoretical supply chain integration framework.

The previous discussion has focused on the integration levels and components that need to be constructed in the supply chain integration framework. Building on the literature review of supply chain management and supply chain relationships, and understanding the importance of internal and external resources for firms, the components of supply chain integration were developed in this section. These are actors' integration, financial integration, information integration, material integration and technological integration. Integration was discussed in terms of these components at both internal and external levels. Emphasis was placed on external integration in this thesis "...because we consider that to be the innovative/new element in the philosophy of supply chain management" (Van Donk and Van der Vaart, 2005, p38). Meanwhile, however, attention was given to internal company integration as it has been suggested by recent research as an effective part of supply chain integration (e.g. Koufteros *et al.*, 2010; Wong *et al.*, 2011; Zhao *et al.*, 2011).

Having demonstrated the need for including both levels of internal and external integration in supply chain integration, the following section discusses the interrelationships between the levels of integration.

3.6 The Interrelationships between the Levels of Integration

While the majority of previous studies found a relationship between internal company integration and improved performance (e.g. Flynn *et al.*, 2010; Zhao *et al.*, 2011; Schoenherr and Swink, 2012), a few studies (e.g. Gimenez and Ventura, 2005) did not support this relationship. Evidence of the importance of internal company integration

for a successful supply chain implementation can be found in much literature (Chen *et al.*, 2009a; Koufteros *et al.*, 2010; Wong *et al.*, 2011; Schoenherr and Swink, 2012; Williams *et al.*, 2013). The importance of internal company integration is that it is considered a key part of the integrated supply chain (Vickery *et al.*, 2003; Campbell and Sankaran, 2005; Zhao *et al.*, 2011; Kocoglu *et al.*, 2011; Wong *et al.*, 2011; Williams *et al.*, 2013). Some authors viewed internal company integration as a prerequisite for having successful supply chain integration (Vickery *et al.*, 2003; Zhao *et al.*, 2011; Schoenherr and Swink, 2012). Zhao *et al.*, (2011) argued that internal company integration has a direct positive impact on external integration. However, their research focused on the cultural context of China and did not focus on a particular industry. They suggested that future research on supply chain integration needs to be studied in other contexts. Vickery *et al.* (2003, p526) viewed the internal functions of the supply chain “... as much as a part of the supply chain as are the external members”. Williams *et al.* (2013) found that internal company integration is a vital element for achieving external integration. Schoenherr and Swink (2012) stated that internal company integration is a major component for achieving supply chain integration that leads to improved organisational performance. They argued that the firm that enjoys high levels of internal company integration will have highly established rules, procedures and stronger relationships between its departments which should help its personnel better exploit external knowledge obtained through external integration efforts. Romano (2003, p123) argued that “one of the major obstacles to fully integrating materials and information flows across the supply networks lays in the inadequacy of internal management systems of the individual firm”. They provided examples including lack of integration of the different information systems used in the firm, fragmentation of information flows and the lack of standardised operational processes. Flynn *et al.* (2010, p67) suggested that “internal integration forms the foundation upon which customer and supplier integration builds...and provides a vital link between customer integration and supplier integration, without which companies are unable to reap the full benefits of their supply chain integration efforts”. Hence, internal company integration seems to be necessary for the external integration and the successful implementation of supply chain integration.

However, recent research on supply chain integration maintained that there is limited empirical evidence on the relationship between internal company integration and external integration (Flynn *et al.*, 2010; Zhao *et al.*, 2011; Schoenherr and Swink, 2012;

Gimenez *et al.*, 2012) and there is inconsistency in the findings from the few previous empirical studies (Schoenherr and Swink, 2012; Gimenez *et al.*, 2012; Zhang and Huo, 2013). Flynn *et al.* (2010, p64) found that “neither supplier integration nor customer integration moderated the relationship between internal integration and operational performance.” However, their study was limited to the focal companies and did not consider the supply chain partners which appeared to distort the picture for understanding supply chain interrelationships. In fact, this limitation was found in previous research on supply chain integration as will be discussed in detail in the next chapter. Gimenez and Ventura (2005) found that internal company integration and external customer integration influence each other and that external customer integration and the internal functional areas that are integrated impacts the performance of internal integration. However, their study focused on internal company integration in terms of dyadic interface between logistics-marketing and logistics-production. Moreover, their study viewed external integration in terms of customer integration in their definition of external integration and they did not consider supplier integration. A recent study by Gimenez *et al.* (2012) suggested that supply chain researchers need to consider the issue of interrelationships between the levels of supplier, customer and internal integration in future research. They suggested that the inability of their study to understand the interrelationships between levels of integration restricted their understanding of supply chain integration. Hence, it is argued that the lack of interest from researchers in studying how the different levels of integration relate to each other and the focus on collecting evidence from only the focal company contributed to this limited view of the supply chain integration phenomenon. This research addresses this gap in literature through extending the unit of data collection to include suppliers and customers as discussed in more detail in Chapter 4.

3.7 A Summary of the Main Issues Shaping the Supply Chain Integration Literature

Literature defined and viewed the concept of supply chain integration flexibly which appeared to produce mixed findings. Most studies agree that this is because of the lack of agreement on its levels and components (Pagell, 2004; Bagchi and Chun-Ha, 2005; Fabbe-Costes and Jahre, 2008; Chen *et al.*, 2009a; Schoenherr and Swink, 2012; Turkulainen and Ketokivi, 2012; Zhang and Huo, 2013). Therefore, the previous discussion of literature focused on the levels and components of supply chain

integration. Thus, there was a need to clearly define and state these aspects. Hence, this chapter suggested that the concept of supply chain integration encompasses external supplier and customer and internal company integration. The components are applied across these levels of integration and include actors' integration, information integration, material integration and technological integration.

However, this chapter suggests that there are more issues which have affected supply chain integration development, producing contradictory and inconclusive findings. The detailed review of the supply chain integration literature showed that there is also inconsistency in the theoretical paradigms that underpinned the subject. Table 3.2 shows that there is variance in the theories used in most studies while some other studies did not ground supply chain integration in any theoretical paradigm. Although this inconsistency is unsurprising as the field of supply chain management still lacks a theoretical underpinning (Harland *et al.*, 2006; Burgess *et al.*, 2006; Defee *et al.*, 2010; Liu *et al.*, 2010), this thesis highlights this as one of the issues shaping the supply chain integration literature and that it is affecting the findings from empirical research. Therefore, the thesis argues that there is a need for more effort in grounding supply chain integration in theory and understanding this theory across the supply chain. This thesis draws on the resource-based view (RBV) for providing a theoretical foundation of the supply chain integration phenomenon and interpreting the empirical findings. RBV is applied across the three levels of external supplier, external customer and internal company integration. Although the original tenet of RBV theory is focused on the intra-firm level (Wernerfelt, 1984), the later extension to the theory in literature represented by introducing the extended resource-based view (ERBV) appeared to support the power of this theory in explaining the supply chain integration phenomenon. Previous literature (e.g. Barratt and Oke, 2007) provided a useful application of RBV theory to understand dyadic information sharing and inter-organisational relationships. However, the RBV theory has not previously been applied for explaining the supply chain integration phenomenon comprising internal company integration, external supplier and customer integration.

The literature review also showed that supply chain integration research needs to consider both new national and industry perspectives. Several authors agree that the role of national context in supply chain integration research is neglected (Zhao *et al.*, 2011; Liu *et al.*, 2013). Thus, recent research called for studies on supply chain integration in different national contexts (Zhao *et al.*, 2008; Yeung *et al.*, 2009; Flynn *et al.*, 2010;

Zhao *et al.*, 2011; Liu *et al.*, 2013; Schoenherr and Swink, 2012). For instance, Yeung *et al.* (2009) and Zhao *et al.* (2011) suggested that there is a lack of studies on supply chain integration from different contexts and that most literature was conducted in a Western culture setting. The other element of context is the product or industry of investigation. Recent research has called for studies on different product contexts to be considered in order to support the development of and our understanding of supply chain integration (Van Donk and Van der Vaart; 2005; Gimenez *et al.*, 2012). Table 3.2 shows that supply chain integration has often been studied in literature from a cross-sector perspective and there was a lack of studies from the perspective of individual product contexts, particularly in the context of garment manufacturers supply chains. This thesis highlights the context as one of the issues shaping the extant supply chain integration literature and that might have affected on the findings from previous research. Hence, this thesis will contribute to the extant literature through studying supply chain integration of Jordan's garment manufacturers whom their products are classified as innovative (Wang and Chan, 2010; Caniato *et al.*, 2012).

Another issue that emerged from the literature review, and will be discussed in detail in the following chapter (i.e. Chapter 4), relates to the unit of data collection across the supply chain (see also Table 3.2). This thesis argues that this is a key issue that impacted on producing varying constructs and mixed findings from previous supply chain integration research as detailed in the next chapter. Hence, this literature review suggests that there are several aspects affecting the development of supply chain integration. While recent research (Fabbe-costes and Jahre, 2008; Flynn *et al.*, 2010; Zhang and Huo, 2013) suggested the inconsistency of the levels and components of integration, this literature review proposed that the national and product contexts, theoretical foundation and validating data across the supply chain are also important factors that need to be considered in supply chain integration research.

The detailed literature review showed that there is a gap in our understanding of the interrelationships between the levels of supply chain integration. Recent research found that internal company integration improved external integration (e.g. Flynn *et al.*, 2010; Zhao *et al.*, 2011; Schoenherr and Swink, 2012) and that external integration did not support internal company integration (e.g. Flynn *et al.*, 2010). However, most of these studies did not specify what levels of external integration are improved in the presence of internal company integration. In fact, there is limited empirical evidence on the relationship between internal integration and external integration (Chen *et al.*, 2007;

Flynn *et al.*, 2010; Zhao *et al.*, 2011; Schoenherr and Swink, 2012; Gimenez *et al.*, 2012) and there is inconsistency in the findings from the very few previous studies (Schoenherr and Swink, 2012). Therefore, recent literature called for the issue of interrelationship between the levels of integration to be considered in future research (Gimenez *et al.*, 2012; Schoenherr and Swink, 2012). Hence, this is an important gap that was found from the literature review concerning supply chain integration.

Based on summarising the issues shaping the recent supply integration literature and the gaps in knowledge, the following points summarise the outcome of the literature review and based on which the research objectives were developed as shown in Table 3.7.

Outcome of the Literature Review	Reference
<ul style="list-style-type: none"> There is a lack of empirical research on supply chain integration comprising suppliers, manufacturers and customers. 	(Wong <i>et al.</i> , 2011; Schoenherr and Swink, 2012)
<ul style="list-style-type: none"> There is a lack of understanding of how the three levels of supplier, internal and customer integration relate to each other. 	(Gimenez <i>et al.</i> , 2012; Schoenherr and Swink, 2012)
<ul style="list-style-type: none"> There is limited empirical evidence on the importance of internal company integration to the successful implementation of supply chain integration. 	(Flynn <i>et al.</i> , 2010; Zhao <i>et al.</i> , 2011; Gimenez <i>et al.</i> , 2012)
<ul style="list-style-type: none"> There is no agreement in literature on the components and levels of supply chain integration. 	(Pagell, 2004; Van Donk and Van der Vaart; 2005; Danese and Romano, 2011)
<ul style="list-style-type: none"> There is inconsistency and inconclusiveness in the empirical findings from previous research on supply chain integration. 	(Turkulainen and Ketokivi, 2012; Prajogo and Olhager, 2012)
<ul style="list-style-type: none"> There is a need for understanding of supply chain integration in different national contexts. 	(Zhao <i>et al.</i> , 2008; Yeung <i>et al.</i> , 2009; Flynn <i>et al.</i> , 2010; Zhao <i>et al.</i> , 2011; Liu <i>et al.</i> , 2013)
<ul style="list-style-type: none"> There is a need for understanding of supply chain integration in different product contexts. 	(Van Donk and Van der Vaart; 2005; Gimenez <i>et al.</i> , 2012)
<ul style="list-style-type: none"> There is a need for involving suppliers, focal companies and customers across the supply chain in the empirical investigation when studying supply chain integration (see Section 4.5.7, Chapter 4). 	(Flynn <i>et al.</i> , 2010; Danese and Romano, 2011; Prajogo and Olhager, 2012; Schoenherr and Swink, 2012)
<ul style="list-style-type: none"> There is a need for applying theory from other disciplines in supply chain integration research in order to gain a greater understanding of the phenomenon across the supply chain, but also to support the advancement in supply chain management discipline. 	Refer to Table 3.2

Table 3.7: Summary of the main gaps in literature

The main gaps identified by this research are summarised:

- There is disagreement in literature on the components and levels of supply chain integration.
- There is a dearth of empirical studies on supply chain integration comprising manufacturers, suppliers and customers.

- There is limited empirical understanding of the interrelationships between internal company integration and external supplier and customer integration.

Hence, the following research objectives are identified:

1. To develop a theoretical framework for integrating manufacturers' internal functional departments with their external supply chain suppliers and customers;
2. To empirically investigate how the levels of supply chain integration are interrelated;
3. To validate the theoretical framework in order to understand competitive advantage for garment manufacturers and their international suppliers and customers.

The next section will construct the supply chain integration framework based on the theoretical development and detailed literature review.

3.8 The Developed Theoretical Supply Chain Integration Framework

The theory development of supply integration framework suggests that both internal and external integration levels are necessary for achieving supply chain integration. A conceptual framework, shown in Figure 3.4, was created based on developing four major constructs derived from the theory development of supply chain integration. These are actors' integration, information integration, material integration and technological integration at both internal and external company levels.

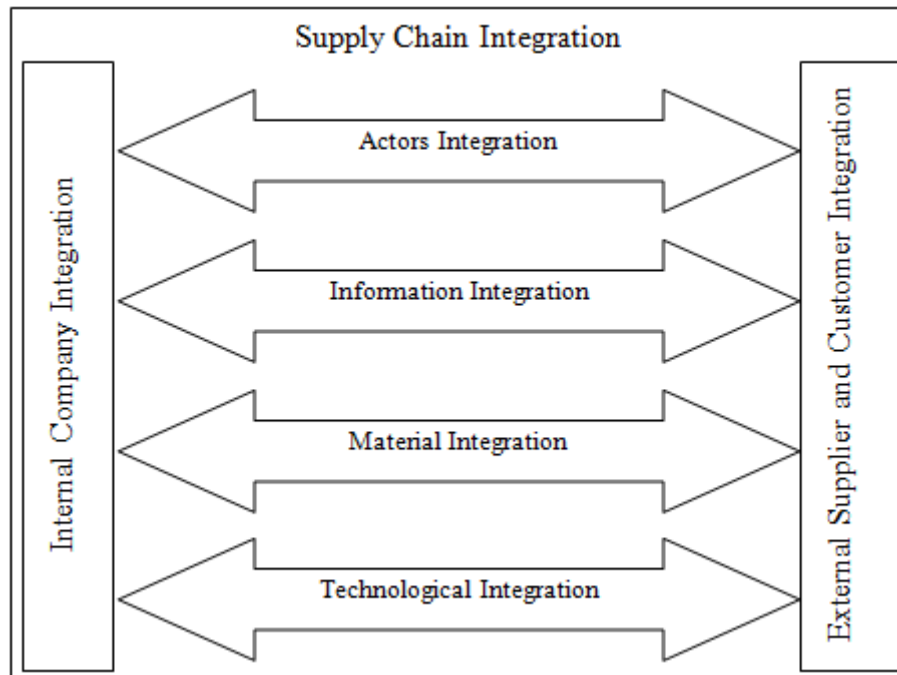


Figure 3.4: A conceptual framework for supply chain integration

The supply chain integration components that were developed from previous sections were tabulated in Tables 3.3 and 3.6 and compared to those of previous studies. Based on Table 3.3 the external supplier and customer integration components are external information integration, material integration, technological integration and actors' integration. In the process of developing a supply chain integration framework, internal company integration was given attention as it was suggested by some previous literature as a key element of successful supply chain integration. The internal company integration components that were constructed in the developed framework are internal information integration, material integration, technological integration and actors' integration. Based on Tables 3.3 and 3.6, financial integration was discounted as it appeared to be less important in previous studies than other the components at both levels of internal and external integration. Therefore, financial integration was considered outside the scope of this thesis.

The theoretical framework of supply chain integration shown in Figure 3.5 below describes the major components of integration as well as the three levels of external supplier, external customer and internal company integration. This theoretical framework introduces the material, information and technology components of both internal and external integration using mutual constructs to reflect the boundary-spanning nature of supply chain management (Bowersox *et al.*, 1999; Chen *et al.*,

2009b). Therefore, it has been taken into account when synthesising the components of the theoretical framework that these components are applicable to both internal and external levels of integration. However, unlike the other components of the framework, the components of internal and external actors' integration were constructed separately to denote that the way these actors can be integrated is different at both levels. This reflects that there are differences within the firm and across firm boundaries in terms of participants, structure, policies and managing relationships (Chen *et al.*, 2009a). In doing so, this theoretical framework stresses the importance of studying internal and external integration at the same time to reflect the boundary-spanning nature of supply chain management. Meanwhile, however, it considers that there are differences between the organisational nature and the wider aspects of supply chain management.

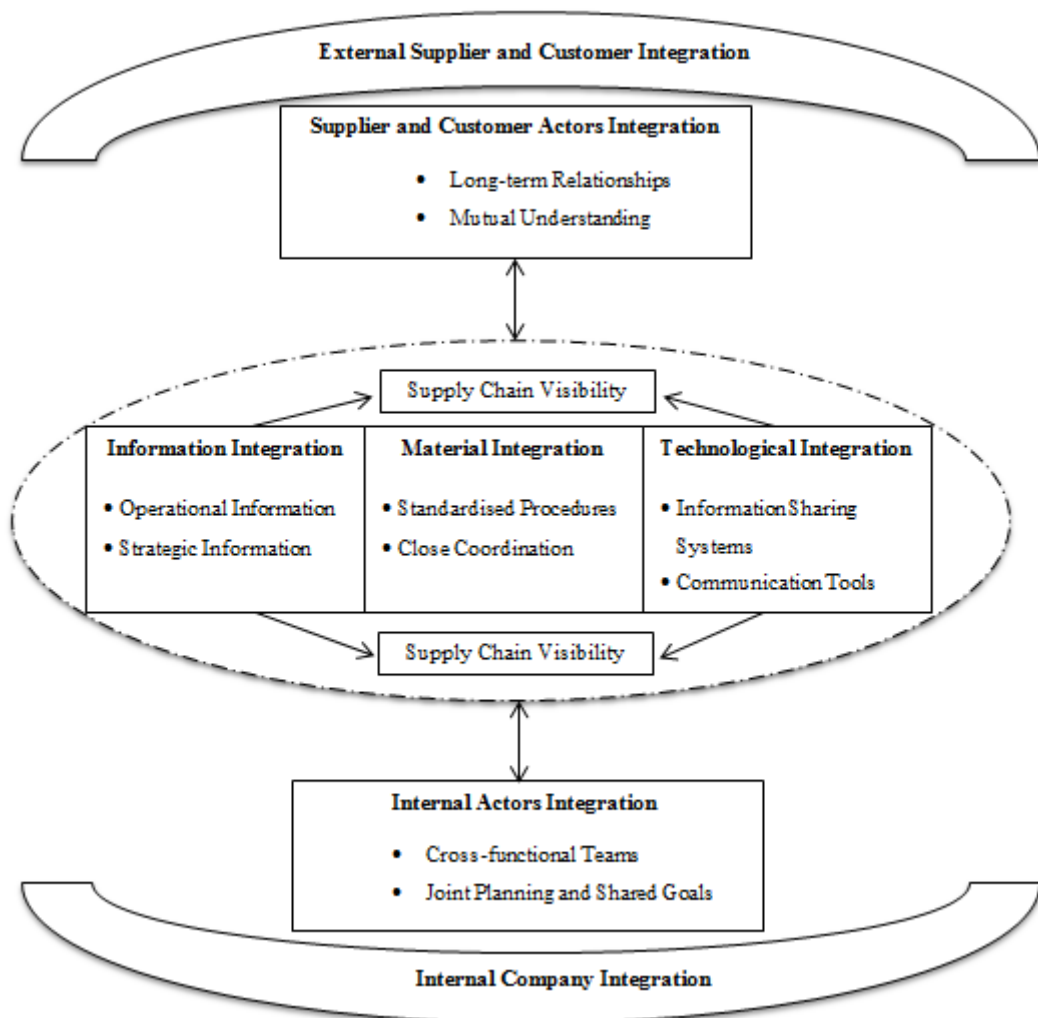


Figure 3.5: A theoretical framework for supply chain integration

Internal actors' integration is represented by linking the production and supporting functions as a single entity. This requires sharing goals and close coordination of activities. The coordination through cross-functional teams is the most widely cited indicator of internal company integration in extant literature. The external actors participating in the supply chain are integrated when they build partnerships based on mutual understanding. Partnerships are developed based on long-term relationships that also include joint planning of resources and goals sharing. In order for information integration to exist information needs to be shared internally between the functional departments but also with suppliers and customers. Trading firms should not only make sure that information is available and shared; but also ensure the accuracy, trustworthiness, timeliness and usefulness of this information (Barratt and Oke, 2007). Therefore, the quality of information shared contributes to the integration of information. Materials are integrated when there are close coordination of activities and standardised procedures are identified and applied to the management of the flow of these materials. This is needed internally between the production and supporting functions but also across organisational boundaries between the firm and its suppliers and customers. Technological integration through the use of information systems and communication tools that enable access to information within the firm and with suppliers and customers was also constructed in the framework. Literature suggests that through achieving technological integration and information integration a higher information visibility in the supply chain is produced. This visibility can be achieved externally with suppliers and customers and internally within the production and supporting functions. Hence, the theory suggests that visibility is a closely related concept to supply chain integration and, therefore, it will be constructed in the theoretical framework.

By integrating these components internally amongst the production and supporting functions and externally with suppliers and customers, as explained in the theoretical framework, the firm becomes integrated in its supply chain system. Table 3.8 below summarises the definitions of the major constructs (combinations of levels and components of integration) of the developed theoretical supply chain integration framework.

	Actors	Information	Material	Technological
Internal Company Integration	The degree to which the production and supporting functions work closely based on cross-functional teams, shared goals and joint planning (Vickery <i>et al.</i> , 2003; Pagell, 2004).	The degree to which the production and supporting functions share high quality information that produces internal visibility (Rungtusanatham <i>et al.</i> , 2003; Barratt and Barratt, 2012).	The degree to which the production and supporting functions collaborate in managing material flow within the company through standardised procedures and close coordination (Chen and Paulraj, 2004b; Gimenez and Ventura, 2005).	The degree to which the production and supporting functions are connected through information sharing systems and communication tools that enable information visibility (Pagell, 2004; Barratt and Barratt, 2012).
External Supplier Integration	The degree to which the manufacturers and their major suppliers are managing their relationships closely based on long-term planning and mutual understanding (Zhao <i>et al.</i> , 2011; Prajogo and Olhager, 2012; Zhang and Huo, 2013).	The degree to which the manufacturers and their suppliers share high quality information that produces visibility in the relationship (Barratt and Oke, 2007; Williams <i>et al.</i> , 2013; Caridi <i>et al.</i> , 2014).	The degree to which the manufacturers and their suppliers collaborate in managing the material flow between each other through standardised procedures and close coordination (Chen and Paulraj, 2004b; Flynn <i>et al.</i> , 2010; Prajogo and Olhager, 2012).	The degree to which the manufacturers are connected with their major suppliers through information sharing systems and communication tools that facilitate information visibility (Barratt and Oke, 2007; Saldanha <i>et al.</i> , 2013).
External Customer Integration	The degree to which the manufacturers and their major customers are managing their relationships closely based on long-term planning and mutual understanding (Zhao <i>et al.</i> , 2011; Prajogo and Olhager, 2012; Zhang and Huo, 2013).	The degree to which the manufacturers and their customers share high quality information that produces visibility in the relationship (Barratt and Oke, 2007; Williams <i>et al.</i> , 2013; Caridi <i>et al.</i> , 2014).	The degree to which the manufacturers and their customers collaborate in managing the material flow between each other through standardised procedures and close coordination (Chen and Paulraj, 2004b; Flynn <i>et al.</i> , 2010).	The degree to which the manufacturers are connected with their major customers through information sharing systems and communication tools that facilitate information visibility (Saldanha <i>et al.</i> , 2013; Williams <i>et al.</i> , 2013).

Table 3.8: Definitions of the major 12 constructs of the developed theoretical framework

The application of the RBV provided a theoretical grounding to the developed theoretical framework across its main levels of external supplier, external customer and internal company integration. Through extending the application of the RBV beyond the firm's boundaries, many scholars argued that developing unique relationships and linkages with supply chain partners is a resource that may create capabilities for the firm (Das and Teng, 2000; Rungtusanatham *et al.*, 2003; Blome *et al.*, 2014). Through synthesising several constructs that are consistent with the RBV principles, a theoretical supply chain integration framework was developed. Although most of the individual constructs of the framework are not new, this is the first study to synthesise them in a single concept. For instance, information integration (Barratt and Oke, 2007), relationships integration (Cousins and Menguc, 2006), technological integration (Wu *et al.*, 2006) and material integration (Prajogo and Olhager, 2012) were studied in previous literature. However, synthesising these constructs at both internal and external firm

levels together from the RBV perspective is viewed as novelty that is provided by this theoretical framework.

3.9 Chapter Summary

This chapter has reported on understanding how firms are linked together through supply chain integration. The detailed literature review in this chapter led to identifying several gaps concerning our understanding of the subject of supply chain integration. These gaps can be summarised into three main points. First, there is disagreement in the literature on the components and levels of supply chain integration. Second, there is a dearth of empirical studies on supply chain integration comprising manufacturers, suppliers and customers. Third, there is limited empirical understanding of the interrelationships between internal company integration and external supplier and customer integration. This research addresses these gaps in literature and investigates how supply chain integration might lead to improved competitive advantage from the perspective of RBV. The theory development of supply chain integration suggested that components of both internal and external integration are included. A theoretical supply chain integration framework that is underpinned by the RBV has been developed in this chapter. The application of the RBV perspective provided a theoretical grounding to the developed theoretical framework across its levels of external supplier, external customer and internal company integration. The next chapter will present the philosophy and methods that will be used for conducting the empirical investigation.

4. Research Philosophy and Methodology

This chapter aims to explain the research philosophy and methodology adopted for inquiring into this study. The assumptions that the researcher will adopt are discussed in terms of three main aspects including ontology, epistemology and methodology. Ontology, that is the beliefs about the nature of reality, is important to describe reality under investigation. Epistemology, that is the beliefs about the best way of inquiring into the nature of the world, is needed to understand how the knowledge about reality is sought. Methodology, that is the processes adopted to enquire into reality, is needed to guide the researcher towards achieving the research objectives (Morgan and Smircich, 1980; Easterby-Smith *et al.*, 2002; Mangan *et al.*, 2004; Bryman, 2011). See Table 4.1 below. The research approach section is set out to show the appropriateness of using the induction reasoning for the purpose of this research. Because this research aims at gaining a greater understanding of the supply chain integration phenomenon qualitative methods based on case study research will be considered (Eisenhardt, 1989; Stuart *et al.*, 2002; Yin, 2009).

Ontology	Assumptions that we make about the nature of reality
Epistemology	General set of assumptions about the best ways of inquiring into the nature of the world
Methodology	Combination of techniques used to enquire into a specific situation
Methods	Individual techniques for data collection, analysis, etc

Table 4.1: Ontology, epistemology, methodology and methods (Easterby-Smith *et al.*, 2002, p31)

4.1 Philosophical Issues

Research is built based on either an explicit or implicit philosophical approach (Perry *et al.*, 1998; Amaratunga and Baldry, 2001) and neglecting the philosophical part can considerably affect the quality of the research in supply chain management (Adamides *et al.*, 2012). Research philosophy refers to the assumptions that the researcher adopts about the way in which they view the world (Saunders *et al.*, 2009). The assumptions a researcher adopts will eventually affect the way the research strategy is developed and research methods are chosen (Easterby-Smith *et al.*, 2002; Saunders *et al.*, 2009). Therefore, it is essential to defend the adopted research philosophy as research progresses (Towers and Chen, 2008). To understand the research philosophy that will be adopted in this research, the following sections will introduce the fundamental research paradigms and social research paradigms.

4.1.1 The Fundamental Research Paradigms

A paradigm is a term that has been used in social sciences to explore research philosophy (Crotty, 1998; Krauss, 2005; Collis and Hussey, 2009). A paradigm can be defined as “a way of examining social phenomena from which particular understandings of these phenomena can be gained and explanations attempted” (Saunders *et al.*, 2009, p118). A paradigm is also defined as “a framework that guides how research should be conducted, based on people’s philosophies and their assumptions about the world and the nature of knowledge” (Collis and Hussey, 2009). Bryman (2011, p24) defined a paradigm as “a cluster of beliefs and dictates which for scientists in a particular discipline influence what should be studied, how research should be done, and how results should be interpreted”. It is the belief or the world view that a researcher adopts to guide the investigation (Krauss, 2005). The philosophical positions that will be discussed can be classified into two fundamental but contrasting research paradigms being either positivism or phenomenology (Remenyi *et al.*, 1998; Amaratunga and Baldry, 2001; Milliken, 2001; Easterby-Smith *et al.*, 2002; Mangan *et al.*, 2004; Burgess *et al.*, 2006; Towers and Chen, 2008; Adamides *et al.*, 2012). These two fundamental paradigms are introduced below.

- **Positivism Paradigm**

Positivism is built on natural sciences and predetermined laws and scientific observations (Robson, 2002). The ontological and epistemological assumptions under the positivism paradigm suggest that knowledge is obtained through direct measurements or observations of the phenomenon and is independent of the researcher interaction (Robson, 2002; Krauss, 2005; Collis and Hussey, 2009). The researcher is independent of the researched persons and therefore they cannot affect each other (Saunders *et al.*, 2009). Positivism considers that the world is deterministic and is operated by laws of cause and effect and reality in the supply chain (Burgess *et al.*, 2006; Adamides *et al.*, 2012) can be obtained through measurable laws and regularities (Morgan and Smircich, 1980; Robson, 2002; Burgess *et al.*, 2006). It is therefore stressed that “the key idea of positivism is that the social world exists externally and that its properties should be measured through objective methods rather than being inferred subjectively through sensation, reflection or intuition” (Easterby-Smith *et al.*, 2002, p28).

Social sciences had originally adopted positivism towards the end of nineteenth century as it had been used successfully in several natural sciences. As social scientists started to recognise the need for a different paradigm that is appropriate for dealing with human minds rather than objects, the phenomenological paradigm was introduced (Mangan *et al.*, 2004).

- **Phenomenological Paradigm**

Phenomenology has been one of the main reactions that were emerged due to the application of positivism in social sciences (Easterby-Smith *et al.*, 2002; Milliken, 2001; Fleetwood and Ackroyd, 2003) including supply chain management (Adamides *et al.*, 2012). This revolution in social sciences represented by phenomenology has been labelled in literature as social constructionism, interpretive sociology, new paradigm enquiry, qualitative methodology, naturalistic enquiry and non-positivism (Milliken, 2001). The phenomenological paradigm has its origins in hermeneutics (Fleetwood and Ackroyd, 2003; Mangan *et al.*, 2004). Hermeneutics is a phenomenological methodology that stresses the importance of taking into consideration the historical and social context when interpreting ancient texts (Mangan *et al.*, 2004; Collis and Hussey, 2009). Hermeneutics has been extended from being concerned with interpretation of sacred texts to include understanding human actions through emphasising the role of context and language in attaining understanding (Robson, 2002; Collis and Hussey, 2009). Thus, it is concerned with how understanding is attained rather than what is understood (Robson, 2002).

Phenomenology is “a philosophy that is concerned with the question of how individuals make sense of the world around them and how, in particular, the philosopher should bracket out preconceptions in his or her grasp of the world” (Bryman, 2011, p18). The main idea is that “reality is socially constructed rather than objectively determined” (Easterby-Smith *et al.*, 1991, p24). The researcher within this paradigm seeks to understand and explain a phenomenon (Burgess *et al.*, 2006). The researcher seeks to explain the assumptions and preconceptions about the phenomenon of the study and integrate them into the research findings (Robson, 2002). Thus, the researcher should not look for external causes and laws to measure people behaviours but rather needs to reveal, understand, explain and appreciate the concealed meanings humans’ put on their own different experiences (Easterby-Smith *et al.*, 1991). Easterby-Smith *et al.* (1991)

made a distinction between three layers for featuring phenomenology from positivism including; the philosophical layer (basic beliefs), the social layer (how researchers should conduct research) and the technical layer (methods for carrying out research). Table 4.2 summarises the key features of positivist and phenomenological paradigms.

	Positivism	Phenomenology
Basic beliefs	The world is external and objective. Observer is independent. Science is value-free.	The world is socially constructed and subjective. Observer is part of what observed. Science is driven by human interests.
Researcher should	Focus on facts. Look for causality and fundamental laws. Reduce phenomena to simplest elements. Formulate hypotheses and then test them.	Focus on meanings. Try to understand what is happening. Look at the totality of each situation. Develop ideas through induction from data.
Preferred methods include	Operationalizing concepts so that they can be measured. Taking large sample.	Using multiple methods to establish different views to phenomena. Small samples investigated in depth or over time.

Table 4.2: Key features of positivist and phenomenological paradigms (Easterby-Smith *et al.*, 1991, p27)

Having introduced the fundamental research paradigms, the next section introduces the inter-paradigms available for researchers.

4.1.2 The Social Sciences Research Paradigms

There are a number of inter-paradigms that give the inquirer into social sciences options to choose from. The paradigms that will be discussed in this thesis are based on Lincoln *et al.*, (2011)'s classification as shown in Table 4.3.

Issue	Positivist	Post-positivist	Social Constructivist	Critical Theory/ post-modernist	Participative
Ontology	Naive realism - "real" but apprehensible	Critical realism- "real" reality but only imperfectly and probabilistically apprehensible	Relativism – local and specific co-constructed realities	Historical realism- virtual reality shaped by social, political, cultural, economic, ethnic, and gender values; crystallised over time	Participative reality – subjective-objective reality, co-created by minds and given cosmos
Epistemology	Dualist/objectivist; findings true	Modified dualist/objectivist; critical tradition/community, findings probably true	Transactional/subjectivist; co-created findings	Transactional/subjectivist; value-mediated findings	Critical subjectivity in participatory transaction with cosmos; extended epistemology of experiential, propositional, and practical knowing; co-created findings
Methodology	Experimental/manipulative; verification of hypotheses; chiefly quantitative methods	Modified experimental/manipulative; critical multiplism; falsification of hypotheses; may include qualitative methods	Hermeneutical/Dialectical	Dialogic/dialectical	Political participation in collaborative action inquiry; primacy of the practical; use of language grounded in shared experiential context

Table 4.3: Basic beliefs of alternative inquiry paradigms (adapted from Lincoln *et al.*, 2011)

- **Post-positivism**

Post-positivists follow, to a large extent, positivists' principles about how social research should be conducted. They believe in scientific methods, theories and laws to obtain reality in social research (Robson, 2002). While positivism holds that the research is independent from the research subject and that these cannot affect each other, post-positivism accepts that the researcher's knowledge and values may affect what is being investigated (Robson, 2002). Post-positivists believe that reality does exist. However, the researcher's limitations make knowing reality or evidence in research imperfect and fallible (Robson, 2002). "There is a single reality, but we may not be able to fully understand what it is or how to get to it because of the hidden variables and a lack of absolute in nature" (Lincoln *et al.*, 2011, p102). It is stressed by post-positivists that finding a truth through research cannot be done by any one study. Rather, other related studies should examine conclusions to reduce possible bias (Robson, 2002; Lincoln *et al.*, 2011). Thus, the validity of research is determined based on peers or the research community rather than from the subject under investigation (Lincoln *et al.*, 2011).

- **Social Constructivism**

Knowledge is socially constructed from the experience and interaction of the inquirer with the inquired into and the environment (Lincoln *et al.*, 2011). Social constructivists believe that reality only exists after its social invention. Social constructivists should renovate the experiences they gained in order to understand the meanings that are placed within the social context (Lincoln *et al.*, 2011; Adamides *et al.*, 2012). “People construct their own understanding of reality; we construct meaning based on our interactions with our surroundings...we construct knowledge through our lived experiences and through our interactions with other members of society. As such, as researchers, we must participate in the research process with our subjects to ensure we are producing knowledge that is reflective of their reality” (Lincoln *et al.*, 2011, p103). Research findings are literally the result of the process of interaction between the inquirer and the inquired into (Morgan and Smircich, 1980). The inquirer needs to understand the social setting and the culture where the data were collected to reflect the actual meaning of the data to the case being investigated (Lincoln *et al.* (2011). Hence, a social constructivist views the supply chain as a social construction that needs the intervention of the researcher in order to understand the meaning in the social context across the supply chain (Adamides *et al.*, 2012).

- **Participatory**

According to this paradigm, individuals construct their own understanding of reality. “Knowledge is socially constructed and takes the form in the eyes of the knower rather than being formulated from an existing reality” (Lincoln *et al.*, 2011, p106). Individuals co-create reality by participation through four ways of knowing including experiential, presentational, propositional and practical (Heron and Reason, 1997). Research seeks to change the people’s lived experiences (Towers and Chen, 2008). “Participants are empowered to define their world in the service of what they see as worthwhile interests. As a consequence, they change their world in significant ways, through action-such as building a road to their village, developing a new form of holistic medical practice-and through experience-developing a sense of empowerment and competence” (Reason, 1998, p279).

- **Critical Theory**

Critical theory belongs to the subjective world of minds (Towers and Chen, 2008). This paradigm claims that “human nature operates in a world that is based on a struggle for power. This leads to interactions of privilege and oppression” (Lincoln *et al.*, 2011, p102). Critical theorists aim at discovering the truth as it relates to social power structure (Lincoln *et al.*, 2011). This paradigm tries to rationally release society from its historical, emotional and social settings. Knowledge that is produced can result in removing oppression. Knowledge is looked at with a historical perspective. The researcher works as a transformative intellectual to understand and transform the symbolic relationships values and emphasises that social justice and equality is the way to develop a fair society (Creswell, 2003; Lincoln *et al.*, 2011).

- **Critical Realism**

This is a recent paradigm that has originated from the need for compromising the two fundamental paradigms of positivism and phenomenology discussed earlier (Adamides *et al.*, 2012). Rather than viewing positivism and phenomenology as contrary extremes, it is urged that they should be viewed as complementary paradigms (Remenyi *et al.*, 1998). Thus, supply chain researchers in critical realism incorporate aspects of both phenomenological and positivist paradigms (Adamides *et al.*, 2012). The story that critical realism shares with positivism is that reality exists out there and is independent of the researcher’s perception (Denzin and Lincoln, 2011). Meanwhile, in accordance with phenomenology, and in contrary to positivism, critical realism suggests that reality is not observable but rather socially constructed. In other words, “realists consider there is only one reality although several perceptions of that reality must be triangulated to obtain a better picture of it” (Perry *et al.*, 1998, p1952). Critical realism tries to appreciate the researcher’s values by suggesting that rather being value-free (as with positivism) or value-laden (as with phenomenology) reality is value-cognisant (Krauss, 2005).

4.2 Research Approach

The research approach is explained in terms of three scientific reasoning approaches. These are deduction, induction and abduction (Robson, 2002; Kovacs and Spens, 2005; Ketokivi and Choi, 2014). Deduction and induction move in two opposite directions

(Robson, 2002; Collis and Hussey, 2009) and are considered the most commonly used approaches of reasoning in supply chain management research (Kovacs and Spens, 2005). The abduction reasoning is an emerging approach that has been introduced to support generating theories in social sciences (Dubois and Gadde, 2002). The transparency of the adopted reasoning is needed to increase the rigor of research (Ketokivi and Choi, 2014). These three research reasoning approaches are discussed below.

4.2.1 Deduction versus Induction Reasoning

Deductive research moves from general to specific and involves deducing a hypothesis based on theoretical considerations in a specific domain then empirically testing it (Collis and Hussey, 2009; Bryman, 2011). Thus, deductive reasoning derives specific instances from general inferences (Collis and Hussey, 2009). Inductive research moves from specific to general and involves the development of a theory based on understanding of the empirical data (Robson, 2002; Saunders *et al.*, 2009; Collis and Hussey, 2009). Thus, contrary to deductive research, inferences are induced from particular instances (Collis and Hussey, 2009). Another key difference between the two approaches is that whereas deductive reasoning seeks to predict and control quantitative research techniques, inductive reasoning attempts to obtain a better understanding and meaning of the phenomenon being investigated (Kovacs and Spens, 2005).

4.2.2 Abduction Reasoning

Despite the popularity and importance of inductive and deductive approaches in research, they are criticised as not being sufficient to understand the actual practice of researchers and generating useful theories (Robson, 2002). Rather than just moving from theory to observations (deduction) or observations to theory (induction), research needs to be viewed as an on-going process (Dubois and Gadde, 2002; Robson, 2002; Spens and Kovacs, 2006) that produces the events observed (Robson, 2002). Cycles between deduction and induction reasoning approaches should exist (Robson, 2002). Hence, abductive reasoning is suggested as an alternative tool to reflect the view that “most advances in science neither followed the pattern of pure deduction nor of pure induction” (Spens and Kovacs, 2006, p374). However, abduction aims at understanding of a ‘new’ phenomenon (Kovacs and Spens, 2005). Table 4.4 introduces the major differences between these three approaches.

Deduction Reasoning	Induction Reasoning	Abduction Reasoning
<ul style="list-style-type: none"> • Scientific principles • Moving from theory to data • The need to explain causal relationships between variables • The collection of quantitative data • The application of controls to ensure validity of data • A highly structured approach • Researcher independence of what is being researched • The necessity to select samples of sufficient size in order to generalise conclusions 	<ul style="list-style-type: none"> • Gaining an understanding of the meanings humans attach to events • Develop theory • A close understanding of the research context • The collection of qualitative data • A more flexible structure to permit changes of research emphasis as the research progresses • A realisation that the researcher is part of the research process • Less concern with the need to generalise 	<ul style="list-style-type: none"> • On-going process • Inductive stage followed by a deductive stage • Understanding of a new phenomenon • Suggest new theories • The collection of both qualitative and quantitative data • Usually applied in action research where there is a need to test hypotheses • Applying new theory in empirical setting • Less concern with the need to generalise

Table 4.4: Differences between deduction, induction and abduction in research (Based on Dubois and Gadde (2002), Spens and Kovacs (2006) and Saunders *et al.* (2009))

Deduction is seen as inappropriate reasoning as this thesis does not seek to scientifically explain causal relationships between variables or test hypothesis from theoretical considerations. Induction and abduction are seen as appropriate for theory building. However, induction aims to generalise findings from empirical data while abduction aims at acquiring understanding of a ‘new’ phenomenon (Kovacs and Spens, 2005). As this thesis aims at gaining a better understanding and meaning of already existing phenomenon (Ketokivi and Choi, 2014) that is; supply chain integration, an inductive reasoning is viewed as the suitable research approach. Hence, the inductive reasoning approach will be adopted for this research.

4.3 Discussion of the Research Paradigms

The main discussion includes whether to adopt a positivist or phenomenological paradigm. Positivism is discounted for not being appropriate for this research. The ontological and epistemological assumptions under the positivism paradigm suggest that knowledge is obtained through direct measurements or observations of the phenomenon and is independent of the researcher interaction. Therefore, this worldview will be discarded as we need in this research to interact with and understand the social context of the study. “The world addressed by positivist science is not the everyday world we experience” (Crotty, 1998, p28). Rather, the phenomenological paradigm will be considered in order to reflect the need in this thesis for understanding the phenomenon (Mangan *et al.*, 2004) of supply chain integration of garment manufacturers in the Jordanian context.

Critical theory is excluded as freeing people from their political, emotional and social insights is not the interest of this thesis. The thesis also excludes critical realism as this

paradigm does not determine whether reality is subjective or objective. Critical realism distinguishes “...world three from the very objective world one and the very subjective world two, although did not specify if it is subjective, objective or something else” (Towers and Chen, 2008, p633). “We do not think critical realism will keep the social science ship afloat. The social sciences are normative disciplines...we do not want a social science that says it can address these issues if it wants to do so” (Denzin and Lincoln, 2011, p11). Hence, the researcher will position himself in one of remaining inter-paradigms which are detailed in Table 4.5 below to give a fuller picture of their beliefs.

Issue	Post-positivism	Social Constructivism	Participatory
Inquiry aim	Researchers try to get as close to the answer as possible. cannot fully attain reality but can approximate it	To understand and interpret through meaning of phenomena (obtained from the joint construction/ reconstruction of meaning of lived experience. understanding/reconstruction	How can the inquirer...go about finding out whatever he or she believes can be known about? What sort of knowledge, if any, is intrinsically valuable?
Nature of Knowledge	nonfalsified hypothesis that are probable facts or law	Individual and collective reconstructions sometimes coalescing around consensus	Extended epistemology: primacy of practical knowing; critical subjectivity; living knowledge
Knowledge accumulation	Accretion – “building blocks” adding to ‘edifice of knowledge’, generalisations and cause-effect linkages	More informed and sophisticated reconstructions; vicarious experience	In communities of inquiry embedded in communities of practice
Goodness or quality criteria	Conventional benchmarks of ‘rigour’ internal and external validity, reliability & objectivity	Trustworthiness and authenticity including catalyst for action	Congruence of experiential, presentational, and practical knowing, leads to action to transform the world in the service of human flourishing
Values	Excluded – influence Denied	Included-formative	Included-formative
Ethics	Extrinsic: tilt toward Deception	Intrinsic-process tilt toward revelation	Intrinsic-process tilt toward revelation
Inquirer posture	‘Disinterested scientist’ as informer of decision makers, policy makers and change agents	Passionate participant’ as facilitator of multi voice reconstruction	Primary voice manifest through aware self-reflective action; secondary voices in illuminating theory, narrative, movement, song, dance, and other presentational forms
Training	Technical quantitative: & qualitative: substantive theories	Resocialisation; qualitative and quantitative; History; values of empowerment and liberation	Co-researchers are initiated into the inquiry process by facilitator/researcher and learn through active engagement in the process; researcher requires emotional competence, democratic personality and skills
Accommodation	Commensurable	Incommensurable	Incommensurable
Hegemony	In control of publication, funding, promotion and tenure	Seeking recognition and input	Power is a factor in what and how we know

Table 4.5: Selected paradigm positions on selected issues (adapted from Lincoln *et al.*, 2011)

Post-positivism was discounted for not being appropriate for this research as it is based on deductive reasoning and the values and inquirer posture are not appropriate for the purpose of this research. The participatory paradigm was also disregarded as the interest of this research is to reconstruct meanings rather than changing the people’s lived experiences through participation.

The research paradigm that will be selected to design and approach this research takes into account the research aims and objectives. The research philosophy that will be adopted is based on a social constructivist orientation. Social constructivism tries to understand and explain human and social reality (Crotty, 1998) which is needed for conducting this research in the Jordanian market context as it is a new evolving sector. This philosophy takes into account the complexity of the business world and, as a result; that every case should be interpreted according to its degree of complexity. Studying the supply chain of the textile and clothing industry is very complicated (Caridi, 2014) and, in this research, different companies will be used whose products and business size differ from each other. Furthermore, the use of RBV for interpreting the findings from the case studies requires that the researcher understands the social setting of the cases. Therefore, the social constructivism is the philosophical orientation of this thesis. Figure 4.1 below shows the rationale for choosing a social constructivist orientation for obtaining a greater understanding of supply chain integration phenomenon in the context of Jordanian garment manufacturers supply chains.

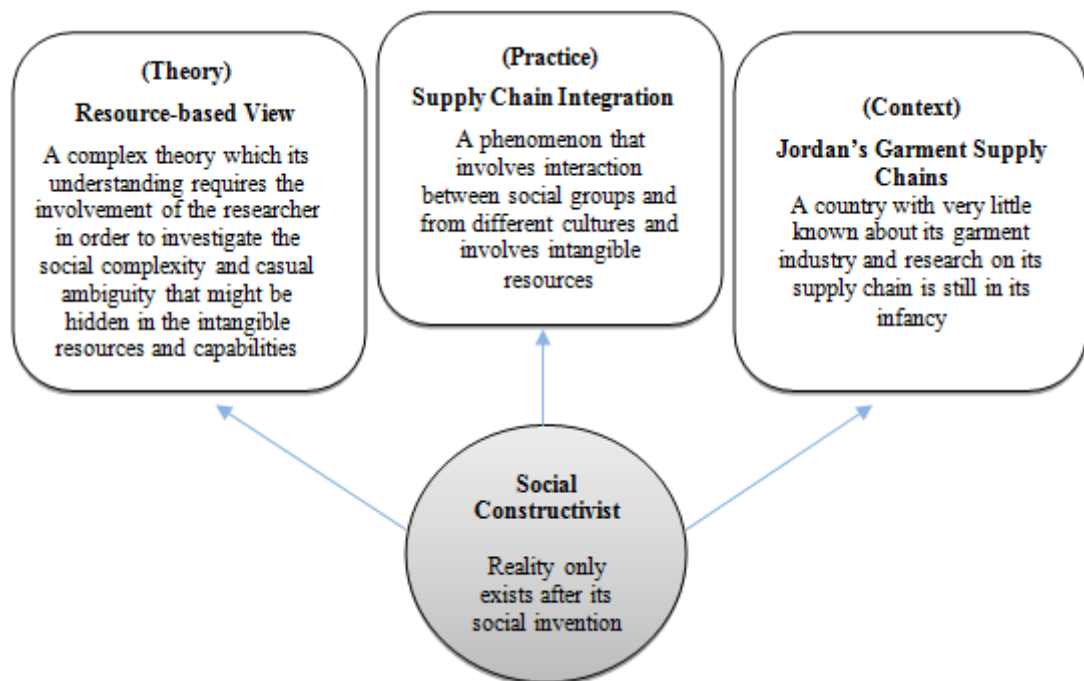


Figure 4.1: The relevance of social constructivist orientation to the research topic

Having justified the philosophical stance of this thesis, the following section will discuss the techniques that will be used for inquiring into the Jordanian garment manufacturing supply chains. The social constructivist orientation will be defended throughout the discussion.

4.4 Qualitative Research Method

Literature has intensified discussion about the use of quantitative and qualitative methods for conducting research (Eisenhardt and Graebner, 2007). Ideally, quantitative research is grounded on scientific approaches or positivism paradigm (Denzin and Lincoln, 2011; Adamides *et al.*, 2012). Supply chain researchers in quantitative methods adopt the deductive research methods of the positivist paradigm (Adamides *et al.*, 2012). Researchers who adopt quantitative research stress the measurement and analysis of causal relationships that might exist between variables rather than studying processes (Denzin and Lincoln, 2011). Quantitative research seeks determination, prediction and generalisation of findings (Golafshani, 2003). In contrast, qualitative research is supported by a naturalistic approach that attempts to understand a phenomenon in its context (Morgan and Smircich, 1980; Eisenhardt and Graebner, 2007) and is advocated by the social constructivist paradigm (Golicic and Davis, 2012). Qualitative research emphasises that reality is socially constructed and that there needs to be a relationship between the researcher and what is being studied (Morgan and Smircich, 1980; Amaratunga and Baldry, 2001; Mangan *et al.*, 2004; Golicic and Davis, 2012). Another important difference between these two fundamental methods is that qualitative research offers more in-depth study across the supply chain than quantitative methods (Adamides *et al.*, 2012). Qualitative researchers seek to answer questions that focus on how social experience is developed (Denzin and Lincoln, 2011). Such researchers are generally interested in clarifying and gaining a greater understanding of phenomena (Eisenhardt and Graebner, 2007; Dul and Hak, 2008). A third approach for research methodology is the use of mixed methods of quantitative and qualitative techniques. This provides research with both objective and subjective measures (Creswell, 2003; Golicic and Davis, 2012). Mixed methods in supply chain research are generally preferable by critical realists (Adamides *et al.*, 2012). Despite the recent calls for mixed methods to be used in supply chain management research, it has been criticised for being depleting of time and money resources (Golicic and Davis, 2012) when applied across the supply

chain and that its critical realist foundation does not determine whether reality is subjective or objective (Towers and Chen, 2008).

Due to the theoretical nature of the supply chain integration framework developed from the literature, the need for understanding the social context in the Jordanian supply chains, and to be consistent with the social constructivist stance, qualitative research methods will be adopted to achieve the research objectives. Qualitative researchers are typically interested in clarification and understanding of phenomena (Morgan and Smircich, 1980) that are dynamic or complex (Golicic and Davis, 2012) such as supply chain integration phenomenon (Van Donk and Van der Vaart, 2005). Moreover, “qualitative research is generally associated with the phenomenological paradigm” (Mangan *et al.*, 2004, p576) which goes in line with the philosophical orientation of this thesis.

Having justified the need for adopting qualitative methods for conducting this research, the next section explains how a case study strategy will be used for inquiring into this research.

4.5 Case Study Strategy

A case study is “a methodology that is used to explore a single phenomenon (the case) in a natural setting using a variety of methods to obtain in-depth knowledge” (Collis and Hussey, 2009, p82). A qualitative case study was defined as “an empirical research that primarily uses contextually rich data from bounded real-world settings to investigate a focused phenomenon” (Barratt *et al.*, 2011, p329). Thus, the purpose of case study research is to obtain a greater understanding of the phenomenon being studied (Voss *et al.*, 2002; Stuart *et al.*, 2002) across the supply chain (Van Donk and Van der Vaart, 2005). The case study is seen an effective strategy for exploring the dyadic links between members in the supply chain (Stuart *et al.*, 2002; Adamides *et al.*, 2012). “The case study approach enables the links between two companies to really be explored, while looking at their (mutual) integrative practices” (Van Donk and Van der Vaart, 2005, p41). What is needed in order to make advancement in supply chain management research is capturing the perspectives of two or more companies in the supply chain through conducting case study research (Kembro and Naslund, 2014). Particularly, case study is an effective strategy for research in garment supply chains as it is a newly emerging industry (Perry and Towers, 2013) with various complexities (Wang and

Chan, 2010; Caniato *et al.*, 2012). Hence, case study research is shown to be appropriate for studying supply chain integration across Jordan's garment manufacturers supply chains. Recent research (Barratt *et al.*, 2011; Ketokivi and Choi, 2014) observed that research in operations management lacked sufficient information about the design and data collection of qualitative case studies. Therefore, the remainder of this chapter provides a detailed discussion of how the qualitative case studies were conducted and analysed.

4.5.1 Quality of Case Study Research

The most commonly used design tests to establish the quality in social research including case study research are construct validity, internal validity, external validity and reliability (Yin, 2009). Construct validity relates to identifying appropriate operational measures for the concepts being investigated. Internal validity refers to establishing a causal relationship where certain conditions are considered to lead to other conditions. External validity refers to the domain to which the study findings are generalisable beyond the case study being investigated. Reliability refers to the extent to which the study's operations such as data collection procedures can yield the same results when repeated (Dul and Hak, 2008; Yin, 2009). Table 4.6 summarises case study tactics for these design tests and the related research phase.

Test	Case Study Tactic	Phase of research in which tactic occurs
Construct Validity	<ul style="list-style-type: none"> - Use multiple sources of evidence - Establish chain of evidence - Have key informants review draft case study report 	Data collection Data collection Composition
Internal Validity	<ul style="list-style-type: none"> - Do pattern matching - Do explanation building - Address rival explanations - Use logic models 	Data analysis Data analysis Data analysis Data analysis
External Validity	<ul style="list-style-type: none"> - Use theory in single-case studies - Use replication logic in multiple-case studies 	Research design Research design
Reliability	<ul style="list-style-type: none"> - Use case study protocol - Develop case study data base 	Data collection Data collection

Table 4.6: Case study tactics for four designs tests (Yin, 2009, p41)

These quality issues were taken into consideration as explained in the phases of research introduced below.

4.5.2 Case Study Design and Selection

The main distinction in designing a case study is between single and multiple-case design (Yin, 2009). Before data is collected, a decision needs to be taken regarding

whether a single-case study or multiple-case studies will be used to achieve the research objectives. Yin (2009) introduced an explanation of the rationale for the use of a single case study in research. First, when the case is critical in testing a very well established theory. Second, a single case is justified “when the case represents an extreme case or unique case” (Yin, 2009, p47). A third reason is when the case is representative. Fourth, it is justified when the case study is revelatory. The last rationale for using a single case study is when the same case needs to be studied over two or more different points in time. On the other hand, research can benefit from the use of a multiple-case study. The use of a multiple-case study is justified when the researcher needs to understand the subject from different perspectives (Saunders *et al.*, 2009). Multiple cases augment external validity and reduce the researcher’s bias (Voss *et al.*, 2002). Particularly, for theory building purposes, the evidence from multiple cases gives the study more robustness (Eisenhardt and Graebner, 2007) and is likely to create more testable theory than a single case (Eisenhardt, 1989) in operations management research (Barratt *et al.*, 2011). The unavailability of rare cases, revelatory cases or representative cases from the Jordanian clothing manufacturing industry makes the use of single case study for the purpose of this research difficult. Moreover, supply chain management is still an evolving discipline (Harland *et al.*, 2006); in particular, supply chain integration is not classified as an established theory in literature (Flynn *et al.*, 2010; Gimenez *et al.*, 2012). Therefore, multiple cases are more appropriate than a single case study for this research. Furthermore, the need of this research to generalise the findings to the Jordanian garment manufacturers regardless of their product type and understand the subject from different perspectives has led the researcher to choose the multiple case study approach (Voss *et al.*, 2002). Van Donk and Van der Vaart (2005) suggested that a multiple-case study strategy is suitable to develop knowledge in the field of supply chain integration.

In order to consider external validity the domain of generalisation will be defined through specifying the criteria for case study selection (Eisenhardt, 1989). The selection of garment manufacturers to be investigated will be based on the following criteria:

- The selected businesses need to be large-sized garment manufacturers located in Jordan and have a trading history of more than five years;
- The selected Jordanian manufacturers need to be suppliers of garments to international markets and involved in supply chain activities;

- The selected businesses must have the willingness to participate in the case study research and provide a full access to the researcher;
- The selected businesses must have the willingness to provide access to their key suppliers and customers and involve them in the case study research;

The selection of the suppliers and customers will be based on the following criteria:

- The selected suppliers and customers need to be major trading partners and had a relationship with the focal company within a particular supply chain for more than three years;
- The selected suppliers have supplied the focal company with primary garment raw materials of fabric and/or trim;
- The selected customers were internationally-based companies involved in wholesaling, retailing or sourcing of ready garments;
- The selected suppliers and customers must have the willingness to participate in the case study research and provide the needed access to the researcher.

These criteria were essential to identify and select the participating five supply chains in this case study research. Having selected the case studies, the next step was to develop a case study protocol for identifying the procedures of data collection process.

4.5.3 Case Study Protocol

The case study protocol is a key tool for ensuring the reliability of case study research during the data collection process (Eisenhardt, 1989; Perry, 1998; Stuart *et al.*, 2002). It aims to guide the researcher in carrying out the data collection (Eisenhardt, 1989) by clearly stating all rules and procedures to be followed. It helps the researcher to think of the sources that data need to be collected from as well as the audience for case study report. A case study protocol is desirable under all circumstances though it is essential for conducting a multiple-case study (Yin, 2009). A case study protocol includes an overview of the project, field procedures, case study questions and a guide for reporting the case study (Perry, 1998). A case study protocol has been developed based on the guidance from Perry (1998) and Yin (2009) and is shown in Appendix A. An overview of the research project is provided in the first chapter of this thesis including research aim and objectives, context and purpose of the research. Field procedures should reflect the natural setting where the data will be collected (Saunders *et al.*, 2009; Bryman,

2011). For example, the researcher needs to make sure the protocol is not developed rigidly (Riege, 2003). Case study protocol questions aim to keep the researcher on track while data collection carries on (Perry, 1998). Case study report must be the concern of the researcher throughout the case study process (Yin, 2009). A basic outline of the case study report within the protocol is needed to ensure the collection of relevant data in the appropriate format in order to guide the researcher to achieve the research objectives.

The last stage of preparing for data collection process, is conducting a pilot case study. This is introduced in the following section.

4.5.4 Pilot Case Study

To ensure the validity of the developed case study protocol and increase reliability during the data collection stage, a pilot case study was carried out (Perry 1998). A pilot case study is important to refine data collection plans in terms of the contents of data to be collected and procedures to be followed as well as developing relevant questions (Perry, 1998; Riege, 2003). It might also help provide conceptual understanding for the research design (Perry, 1998). Reporting from the pilot case should explicitly state the lessons learnt for enhancing both research design and data collection procedures. Because the pilot case study is considered as an integral part of the case study protocol (Yin, 2009), the lessons learnt from the pilot study will be eventually reflected on the design and contents of the protocol (Riege, 2003). A pilot study is different from a pre-test where the findings are used to refine the theoretical framework and considered an integral part of the case study research findings (Yin, 2009). Therefore, it is essential to mention that the results from this pilot study will not be combined with the results from the actual case study research as the purpose of the pilot study is to refine data collection procedures and improve the research design. Moreover, the research is conducted in a relatively unexplored context represented by studying the Jordan's garment manufacturers supply chains which supports the need for conducting this pilot study in order to identify the characteristics of the Jordan's garment sector prior to conducting the actual data collection.

A single pilot case study was conducted with a garment manufacturer and one of its key customers in September, 2012. A detailed description and analysis of this pilot case study, the pilot study protocol as well as the lessons learnt from conducting this case are introduced in Appendix B. A summary of the lessons learnt are listed below.

- The pilot study provided insights about the underdeveloped nature of garment industry in Jordan (see also Appendix E which provided a background about the garment industry in Jordan).
- The quality of information shared in terms of its frequency and accuracy was not understood from the pilot study. Therefore, there was a need to add separate questions about the quality of information shared internally but also externally with suppliers and customers.
- There was a difficulty in making a clear flow and consistency of questions during the interviews as the interviewees' answers about external supplier integration were different from external customer integration. This was also found to be a problem during analysing the pilot study as it was not easy to codify the data collected about this construct. Therefore, the questions related to external supplier and external customer integration need to be listed separately in the case study protocol.
- There was difficulty in managing some questions as the interviewees were asked about internal company integration between the internal departments without specifying what departments. Therefore, the focus of the questions of internal company integration needs to be about the production and supporting functions (value adding functions) rather than asking about integration amongst the departments in general.
- Data reduction and analysis based on categorising the data according to the theoretical framework was found to be appropriate. However, external supplier and external customer integration need to be shown in two separate categories in order to better present the data.
- Using the mobile phone for recording the data was found to be unreliable. For example, the memory ran out of space quickly, the voices were not very clear during transcribing the interviews and the phone battery was low after recording only two interviews. Therefore, it was decided that a voice recorder should be used during the actual data collection stage.
- The researcher gained some experience on how to deal with the interviewees who go off-track and talk about things unrelated to the subject during the interviews.
- Conducting a pilot study proved to be a valuable instrument for increasing the reliability and validity of research.

Having conducted the pilot case study and updated the case study protocol, the next stage is starting the actual data collection process.

4.5.5 Access to the Case Study Supply Chains and the Two Phases of Data Collection

After updating the case study protocol and digesting the lessons learnt from conducting the pilot case study, a trip was arranged to Jordan between December 2012 and February 2013. Three identification letters were written by the Research Office at the School of Management and Languages from Heriot-Watt University, the Academic Supervisor and the Dean of the School of Business at the German-Jordanian University (the sponsor of this research project) to gain access to Jordanian manufacturers and their suppliers and customers. These letters contained information about the researcher, subject of the thesis, the data collection methods and sources of evidence, data confidentiality and the expected results of the thesis.

The starting point to gain access to the companies who met the case study selection criteria identified in the protocol was a meeting with the president of the Jordanian Garment, Accessories and Textiles Exporters' Association (J-GATE). During this meeting arrangements were made with three Jordanian manufacturers (referred to as Company A, B and C in the empirical chapters) after contacting key persons in these companies. Organising, codifying and analysing data occurred during the data collection. At this stage, although some themes appeared to become clear from the data collected, there was not high confidence in whether data from these three companies will be sufficient to fully understand supply chain integration phenomenon in the Jordanian context. Therefore, two more manufacturers were accessed during conducting the three case studies with the previously identified companies. The Operations Manager of Company A and the Merchandising Manager of Company B showed high enthusiasm with regard to the research topic so they provided a great help in that they identified several other manufacturers from which Company D and Company E were eventually involved in the case study research. Although accessing other companies for participating in the case study research was still possible, the data at this stage reached a saturation level (Voss *et al.*, 2002). Therefore, it was decided not to add more cases for the purpose of this research. Instead, the focus was on collecting more in-depth data through conducting a second phase of data collection to increase the data coverage for each construct in the theoretical supply chain integration framework. This was performed through conducting follow-up interviews and increasing the observational

and documentary evidence. Hence, after returning to the UK (between 4th February and 10th April 2013) in order to map the data coverage from the first phase (see Appendix C), and finish the individual analysis of the five case studies, another trip was arranged to Jordan in mid of April 2013. At this stage, the five focal companies were well-known to the researcher and a close working relationship was developed based on the period spent together during the first phase of data collection. Therefore, access to key persons was easier and follow-up interviews and additional observational and documentary evidence was collected efficiently. Based on the Data Coverage Map shown in Appendix C, gaps from the first phase were filled. Moreover, during this phase of data collection, 2 major interviews were conducted with the Operations Manager of Company B and Operations Manager of Company E who were on holiday during the first phase of data collection. Another advantage for conducting the second phase was conducting a face-to-face interview with the General Manager of Supplier D who was on a business visit to Company D.

The data collection process involved several difficulties as it required travel to production facilities located in remote areas. Therefore, the investigator was asked by Heriot-Watt University to sign a Risk and Assessment Form prior to travelling to Jordan for conducting data collection. Several appointments with the participating companies were postponed as a result of the exceptional snow storm that hit Jordan in January 2013. However, much of the data collected was during a relaxed period (late December and early January) for Jordanian manufacturers as this is the holiday season for their trading partners in the Western World. This allowed the researcher to lengthen the interview time as needed and increase the interaction with the staff during collecting the observational evidence. The next section details the data sources used for collecting evidence.

4.5.6 Collecting Evidence from Case Study Research

There are six sources of case study evidence identified by Yin (2009) including; documents, archival records, interviews, direct observation, participant observation and physical artifacts. Considering more than one source of evidence from case study research leads to increase the triangulation (Eisenhardt, 1989; Stuart *et al.*, 2002). The data sources from which evidence will be collected for this thesis are interviews, documentation and direct observations as detailed below.

- **Semi-structured Interviews**

Interviews are one of the most important sources of data in case study research (Eisenhardt and Graebner, 2007; Yin, 2009). There are three types of case study interviews being unstructured, structured and semi-structured interviews (Saunders *et al.*, 2009). Semi-structured interviews will be conducted for examining the Jordanian garment manufacturers supply chains based on understanding the main themes developed from the literature review and the theoretical supply chain integration framework. Semi-structured interviews were used in this thesis as the researcher will need to flexibly change the order of the questions depending on the importance during the interviews and to add or skip some questions in the context of research situation (Dubois and Gadde, 2002; Robson, 2002; Saunders *et al.*, 2009). This type of interviews is seen as allowing the investigator to explore issues in their social context. Such interviews “provide you with the opportunity to ‘probe’ answers, where you want your interviewees to explain, or build on, their responses” (Saunders *et al.*, 2009, p324). Semi-structured interviews are particularly necessary so as to be consistent with the phenomenological paradigm where the researcher is interested in understanding the meaning that interviewees place on their words. Informants in semi-structured interviews may express their words in a way that increases the significance and depth of the data and enhances the understanding of the subject (Yin, 2009).

A total of 59 interviews were conducted during the data collection first phase (43 major interviews) and second phase (16 follow-up interviews) across the five case study supply chains. Figure 4.2 below shows the type and number of interviews conducted. While each major interview lasted from 40 to 70 minutes, each follow up interview lasted from 10 to 25 minutes depending on the depth of data provided by each interviewee. The major interviews were more detailed as the interviewees were asked the full list of questions developed in the case study protocol shown in Appendix A.

Total Number of Interviews																																			
59																																			
Suppliers 7			F. Companies 43			Customers 9																													
Major Interviews						Follow-up Interviews																													
43						16																													
Suppliers 6			F. Companies 30			Customers 7			Suppliers 1			F. Companies 13			Customers 2																				
Face-to-face Interviews				Telephone Interviews				Face-to-face Interviews				Telephone Interviews																							
34				9				13				3																							
Suppliers 1			F. Companies 30			Customers 3			Suppliers 5			F. Companies 0			Customers 4			Suppliers 0			F. Companies 13			Customers 0			Suppliers 1			F. Companies 0			Customers 2		

Figure 4.2: The hierarchy of interviews conducted across the five case studies

An additional 16 follow-up interviews were conducted during the second phase of data collection in order to gain a greater understanding of the developed themes and increase the data coverage of each construct from the interviews. Appendix C shows how the gaps in each construct were identified and filled after conducting the first phase of data collection (see also Figure 4.3 below). Furthermore, Table 4.7 below shows the number of interviews conducted for understanding each construct of the supply chain integration framework. This detailed information about how evidence was collected from interviews was necessary to control construct validity through developing a chain of evidence.

Integration Constructs	Case A								Case B								
	Operations Mgr	Merch Mgr	Production Mgr	Logistics Mgr	Quality Mgr	Documents	Supplier A	Customer A	Quality Mgr	Merch Mgr	Logs Mgr	Bus Dvl Mgr	Operations Mgr	Admin Mgr	Documents	Supplier B	Customer B
External Customer Integration																	
Customer Information Integration																	
Sharing Operational Information	1	1	1	1	2	1	1	1	2	1	1	1	2	1	1	1	2
Accuracy	1	1	1	1	1	1		1	1	1	1	1	1	1			1
Timeliness	1	2	2	2	1	1		1	1	2	2	2	1	1			1
Trustworthiness	1	2	1	1	1	1		1	1	2	1		2	1			1
Sharing Strategic Information	1		1	1	1	2	1	1	1	1	1	1	1	2	1	1	1
Accuracy	1	1	1	1	2	1		1	2	1	1	1	1	1			1
Timeliness	1	1	1	1	1	1		1	1	1	1	1	1	1			1
Trustworthiness	1	1	2	2	1	1		1	1	1	2	2	1				2
Customer Material Integration																	
Standardised Procedures	1	2	2	1	1	1		2	1	1	1	2	2	1		1	1

Figure 4.3: An example of how the depth of data was mapped in Appendix C

To obtain a higher data accuracy, the interviews were conducted with at least five different persons from the manufacturers (focal companies) and at least one person from each of the participating suppliers and customers. Interviews were conducted with high-ranking interviewees across the five supply chains in order to produce a more reliable data (Das *et al.*, 2006; Eisenhardt and Graebner, 2007). Typically, the interviews at each focal company were conducted with the Operations Manager, Merchandising Manager, Purchasing Manager, Logistics Manager and Production Manager. The interviews with the suppliers were typically conducted with Sales/Export Manager. From customers, although all interviews were conducted with high-ranking persons, interviewees' titles varied depending on the company size. From the small and medium-sized firms, these were typically conducted with the General Manager. From the large-sized firms, interviews were typically conducted with the Purchasing Manager or Commercial Manager. Appendix C shows how evidence was collected from each interviewee in each case study. Moreover, a diagram that clarifies the persons that were interviewed and number of interviews from each supply chain is shown at the beginning of each case analysis in Chapter 5. All the major and follow-up interviews (making together a total of 59 interviews) were transcribed and codified using the NVivo Qualitative Data Analysis Software.

Most interviews were recorded (Voss *et al.*, 2002) after taking the interviewees' permission. However, three interviews were not recorded based on the informants' request. Two of them were female informants who preferred not to have their voices recorded. The researcher felt that this was related to social and cultural reasons where

females are often hesitant to have their voices taped. These three unrecorded interviews were transcribed based on an extensive note-taking. Moreover, these transcripts were returned to the informants to ensure their accuracy. None of the informants made any changes to the transcripts.

One interview (with the Production Manager of Company C), which lasted for 55 minutes, was recorded for only the first 15 minutes. The reason was that the interviewee asked to stop the recording as he had an emergency in the production facility. The interview was resumed after 10 minutes but at the end of the interview it was found that the researcher forgot to switch on the voice recorder again after the meeting was resumed. However, the interview was transcribed on the same day it was carried out based on the note-taking and the recorded part of the interview.

The second most important source of data in this case study research was the documentary evidence as detailed below.

- **Documents**

Other sources of data collection in case study research also include evidence from documents (Stuart *et al.*, 2002). This may include customer and supplier files, company records, notes, email correspondence and reports (Yin, 2009). A detailed list of documents collected from the five case studies is shown and codified (Voss *et al.*, 2002) with the supply chain integration constructs in Appendix D. Figure 4.4 below shows an example of how documentary evidence was organised and coded in Appendix D. These included a total of over 200 documents from the five focal companies, examples included minutes of meetings, operating procedures and supplier and customer contact documentation.

Case	Doc No	Doc Code	Doc Name	Doc Description	SUPPLY CHAIN INTEGRATION CONSTRUCTS													
					Background	Internal				Supplier				Customer				
						Actors	Information	Material	Technological	Actors	Information	Material	Technological	Actors	Information	Material	Technological	
A	2	A-2	EDI System EU Customer)	Example of EDI system	x										x	x	x	x
A	3	A-3	ERP System	Internal information system	x		x	x	x									
A	4	A-4	EDI with (US customer)	Example of EDI	x										x	x	x	x
A	5	A-5	Material Dispatching Procedures	Info about material dispatching	x	x	x	x	x							x	x	
A	6	A-6	Receiving and inventory Control	Inventory control instructions	x	x	x	x	x		x	x						
C	2	C-2	Meeting agenda 1/05/2013	Departmental weekly meeting	x	x	x											

Figure 4.4: An example of how documentary evidence was coded in Appendix D

These documents were necessary to support the evidence collected from interviews and gain a greater understanding of other activities such as the used information sharing systems (e.g. A-2, A-4, A-12 and A-13). Documents included also clarifications of evidence collected through direct observations (e.g. Documents C-12, C-17 and C-18 which show photos taken during the visits to Company C's warehouses). Taking such photos would help to communicate some characteristics of the case to external observers (Yin, 2009). Another benefit for using documents was gaining a greater understanding of the detailed internal operating procedures and to what extent these are understood and applied by the different functional departments, and synchronised with the external suppliers and customers procedures (e.g. Documents B-1, B-2, B-3 and B-27). Another example of how documents provided a rich source of evidence is seen in the minutes of meetings (e.g. C-2, C-3, C-4 and C-5, and E-9 and E-17) and internal daily and monthly production and performance reports (Documents E-23 to E-39) where it was found for example that Company C and E suffered from underutilisation of production capacity. Chapter 5 clarifies how the documentary evidence together with the other data sources was used for analysing the individual case study supply chains. Table 4.8 below shows the number of documents collected for understanding each construct of the supply chain integration framework.

Hence, documents provided key evidence for supporting the construct validity through verifying the accuracy of data and unveiling new activities and procedures for understanding supply chain integration phenomenon in the garment industry context.

- **Direct Observation**

Observational evidence can provide additional data to support the findings from the interviews and documents (Eisenhardt, 1989; Stuart *et al.*, 2002; Barratt *et al.*, 2011). Observations were made throughout the production facilities and managers' offices visits and sidewalks during the visits needed for the interviews (Dubois and Gadde, 2002; Yin, 2009) at the five focal companies. Observational evidence was also collected through taking photos of the focal companies' warehouses, meeting rooms and production department. Moreover, observations were made during visits to the suppliers and customers who were interviewed face-to-face and those who had sourcing offices in Jordan. It was also interesting to make direct observations during the suppliers and customers visits to the focal companies' sites where there was direct interaction through

exchanging of information and informal meetings. Table 4.7 below shows the number of visits that were made for each case study and number of hours spent in obtaining observational evidence.

Case	Number of Sites Visited	Total Number of Visits	Observation in Hours	Locations Where Observational Evidence was Collected
A	2	4	16	Focal company's raw material (RM) and finished goods (FG) warehouses, managers' offices, production units, quality inspectors and meeting room.
B	2	5	18	Focal company's RM and FG warehouses, managers' offices, production units, quality inspectors, meeting room, packaging and despatching department. Customer's sourcing office.
C	2	4	15	Focal company's RM and FG warehouses, managers' offices, production units, quality inspectors, packaging and despatching department, retails units.
D	3	4	15	Focal company's FG warehouse, managers' offices, production units, quality inspectors, meeting room, packaging and despatching department and customer's sourcing office.
E	3	3	10	Focal company's RM and FG warehouses, managers' offices, production units, quality inspectors, meeting room, packaging and despatching department.
Overall	12	20	74	Generally, observations were collected from the production and supporting departments, warehouses, meeting rooms and, where possible, customers' sourcing offices

Table 4.7: An overview of the observational evidence collection

Observational evidence was necessary to obtain a better understanding of several activities (Stuart *et al.*, 2002; Ketokivi and Choi, 2014). For instance, observation at the raw material and finished garments warehouses supported the evidence collected about material integration. The obsolescence of fabric stock observed at Company C's warehouse provided higher confidence in the evidence collected from interviews but also opened avenues for asking more questions about customer material integration and supplier material integration in the succeeding interviews. Observation provided also compelling evidence as it allowed the researcher, for example, to understand how the dedicated customer service coordinators and on-site quality representatives contributed to support external customer integration at Company A, B, D and E. Table 4.8 in the following section shows the number of hours spent for collecting evidence from observation for each construct.

4.5.7 Triangulation in Supply Chain Integration Research

Research in supply chain management has been criticised in recent literature for its lack of diversity of methods that contribute to theory-building (Golicic and Davis, 2012; Kembro and Naslund, 2014). Particularly, previous research on supply chain integration failed to cover the different levels of supply chain integration and focused on collecting evidence from only the focal company (e.g Frohlich and Westbrook, 2001; Cousins and Menguc, 2006; Prajogo and Olhager, 2012; Zhang and Huo, 2013). See Table 3.2 which

details methods of inquiry and data sources in previous research on supply chain integration. This thesis is different from previous empirical research in that evidence was collected from the focal companies, suppliers and customers. In particular, evidence was collected from garment manufacturers, their raw material suppliers and international customers. In fact, when studying integration across the supply chain, the need for hearing the story from both suppliers and customers across the supply chain has been called for extensively in recent literature (e.g. Flynn *et al.*, 2010; Danese and Romano, 2011; Prajogo and Olhager, 2012; Schoenherr and Swink, 2012) and is needed in order to provide unbiased conclusions in case study research (Yin, 2009). Although Flynn *et al.* (2010)'s empirical study of supply chain integration included internal, supplier and customer integration; they suggested that the inability of their study to collect data from the different supply chain members is a research limitation that needs to be considered in future studies. Danese and Romano (2011) also considered this issue as a major limitation of their study and that evidence should not be collected only from focal companies when studying supply chain integration. Similarly, two more recent studies by Schoenherr and Swink (2012) and Prajogo and Olhager (2012) suggested that future empirical research on integration needs to collect evidence from at least two or three members in the supply chain. The validation of the evidence collected from the garment manufacturers through involving customers and suppliers was useful in that it provided an understanding of small and hidden details. For instance, hearing the story from also the external customers and suppliers provided a better understanding of the intangible constructs such as mutual understanding.

Studying supply chain integration at three different levels of internal company, external supplier and external customer rather than restricting it to a single level provided a clearer picture of reality. This resulted in increased internal validity through conducting an accurate analysis of events and their inferences across the supply chain where the explanation of occurrence of an event could be caused by another event within a particular supply chain. For instance, in Chapter 6, it was not possible to understand the lack of operational improvements through internal company integration in Company C without investigating external customer integration. Based on this further investigation, it was found that the company had limited understanding of future customer needs. Therefore, it would be restrictive and misleading to conclude that internal company integration was not found to have a positive impact on operational performance and achieving supply chain integration. Hence, through understanding behaviours across the

supply chain rather than within only a single level of integration such as internal company integration a greater understanding of the subject was obtained.

This approach of studying companies across the supply chain is consistent with the phenomenological paradigm where the situation is looked at in totality (Easterby-Smith *et al.*, 1991; Mangan *et al.*, 2004). The positivist paradigm has long been criticised for overstressing the role of the focal company in supply chain research (Adamides *et al.*, 2012). However, this thesis argues that previous supply chain studies have not purely applied phenomenological research but rather applied phenomenology with some elements of positivism. Supply chain scholars have conducted phenomenological research by obtaining reality through social interaction with the focal company. However, they neglected the role of supply chain partners in the search of reality. Thus, this thesis suggests that the way phenomenological research should be conducted in the supply chain management discipline is different from the way it is conducted in any other discipline in social sciences. Researchers cannot claim to have drawn empirical findings based on the phenomenological context of a study while they are independent of reality that might exist somewhere else in the supply chain. This is not to challenge the efforts of previous phenomenological research in supply chain management, but rather to stress that the complexity of supply chain management discipline needs to be understood through a pure phenomenological research approach across the supply chain. Therefore, phenomenological research in supply chain management is at risk of losing its integrity as researchers are frequently inquiring into reality across the supply chain from only the perspective of the focal company.

The efforts of considering more than one source of evidence (interviews, documents and observations), interviewing several informants within each case study and collecting evidence across the supply chain will result in increased triangulation (Eisenhardt, 1989; Dubois and Gadde, 2002; Stuart *et al.*, 2002). As suggested by Dubois and Gadde (2002), this triangulation was not only used to verify the accuracy of data collected but also to unveil aspects that are unknown to the researcher without using multiple sources. A summary of the data coverage of each construct from the data sources is shown in Table 4.8 below. The large number of tables, figures and appendices developed in this chapter was essential to maintain a chain of evidence (Miles and Huberman, 1994; Voss *et al.*, 2002).

Construct	Number of Interviews	Number of Documents	Observation in Hours
Internal Company Integration			
Actors	32	48	10
Information	36	22	12
Material	32	53	10
Technological	36	34	5
External Supplier Integration			
Actors	42	3	4
Information	38	32	6
Material	30	21	3
Technological	42	16	3
External Customer Integration			
Actors	48	13	7
Information	48	45	10
Material	35	20	5
Technological	41	18	4

Table 4.8: Data coverage from sources of evidence across the case study research

Table 3.2 summarises the previous studies on supply chain integration which shows that previous research have largely been based on surveys and neglected the role of supply chain partners in collecting evidence. A recent study by Barratt *et al.* (2011) found that there is a need for the issues of design and quality of inductive case study research in operations management to be improved. Unfortunately, improved quality of research has been negatively affected by the focus on quantity of publications in response to the promotion criteria in academia (Golicic and Davis, 2012). It was therefore unsurprising to find that previous research on a phenomenon such as supply chain integration that has been in literature since late 1990s has neglected the role of external partners and focused on obtaining evidence from the focal company of the study. In fact, this criticism applies to supply chain management research in general and is not limited to research on integration. Sachan and Datta (2005) observed that most research on logistics and supply chain management was limited to the perspective of the focal company. A recent systematic literature review by Kembro and Naslund (2014) found that only 3 out of 82 empirical studies collected evidence from more than one company in studying information sharing across the supply chain. However, this seems to be contradictory to the philosophy of supply chain management where the external partners are the novel elements (Van Donk and Van der Vaart, 2005).

The next stage was to analyse the data collected from the qualitative case studies. This is introduced in the following section.

4.6 Inductive Data Analysis from Case Study Research

The first step towards data analysis is organising and codifying the data collected (Voss *et al.*, 2002). Several computer-assisted tools such as NVivo, Atlas.ti and HyperRESEARCH are available to help researchers code and categorise large amounts of data from qualitative case study research (Yin, 2009). However, it is essential to understand that these software packages are “assisted and tools” (Yin, 2009, p128) that will not carry out any analysis, and the software outputs themselves cannot be used as if they were the final results of the analyses as is the case with statistical analyses. The NVivo Qualitative Data Analysis Software was used for organising and codifying the interviews collected from each case study supply chain. However, as the case study evidence was collected from manufacturers, suppliers and customers from different cultures and whom their native languages are different, the NVivo was seen to have a limitation in dealing with such differences. The experience of the researcher in dealing with the NVivo suggests that its use did not create the needed confidence in conducting the data analysis. Particularly, in the phenomenological research in which the researcher needs to reveal, understand and explain the concealed meanings humans’ put on their own different experiences and explain the situation in totality. Nonetheless, the NVivo was seen as a useful tool to organise and codify the large amounts of narrative texts collected from the interviews across the five case study supply chains.

The two key steps for the analysis of case study research of within-case-analysis and cross-case-analysis were applied in this research (Eisenhardt, 1989). The purpose of within-case-analysis is to familiarise the researcher with each case study as an independent entity and allow the unique patterns of each case to emerge. Despite the descriptive write-ups created at this stage, this is the first step for developing insights (Barratt *et al.*, 2011) from the cross-case analysis (Voss *et al.*, 2002). The cross-case analysis compares and contrasts the different data across the different case studies (Ketokivi and Choi, 2014). This process allows the researcher to go beyond the initial interpretations of each case and capture findings from the data (Barratt *et al.*, 2011). There are several techniques for conducting cross-case analysis. An effective technique of conducting cross-case analysis is choosing a category and then comparing and contrasting the data within that category (Miles and Huberman, 1994; Voss *et al.*, 2002). In this thesis, 12 categories were compared and contrasted based on the developed theoretical supply chain integration framework (Miles and Huberman, 1994).

The data analysis process occurred simultaneously with the data collection process. This was useful to capture reality as it emerged from data (Barratt *et al.*, 2011). For instance, the initial analysis during the data collection process suggested that most garment manufacturers worked with suppliers nominated by their customers. Therefore, during the following stages of data collection, interviewees were asked about the impact of the nominated supplier model on achieving external supplier integration. Another example is that informants focused on the issue of communication difficulty because of language difference. This issue would not have emerged in the empirical model without conducting the data analysis process during data collection.

Consistent with the inductive research approach shown in Figure 4.5 below, this thesis used the theoretical knowledge on supply chain integration from prior research to guide the empirical investigation. The analysis of data collected from real-life observations were developed into an empirical supply chain integration model, shown in Figure 7.1, Chapter 7. The empirical investigation resulted in several findings that were developed into conclusions as shown in Chapter 7 and Chapter 8.

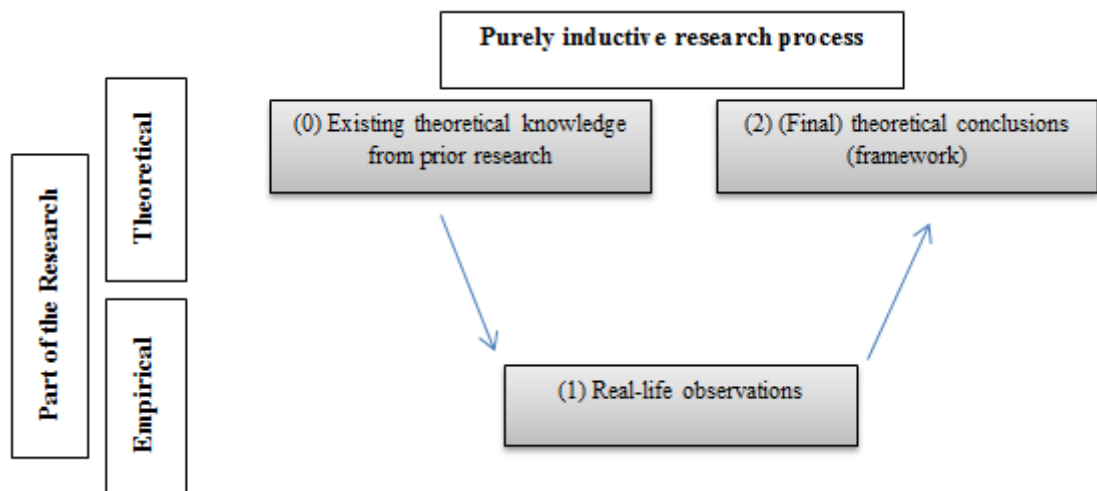


Figure 4.5: Inductive research process (Kovacs and Spens, 2005, p137)

One of the most challenging issues with case study research is how to draw and validate conclusions from across-case analysis (Miles and Huberman, 1994). This thesis controlled the internal validity through developing a pattern matching in order to allow the reader to move between the summaries and understand how the conclusions were made (Eisenhardt, 1989). Summary tables were used at the end of each case study analysis in the case-by-case analysis chapter (Chapter 5). “A separate table that summarises the evidence for each theoretical construct is a particularly effective way to present the case evidence.” (Eisenhardt and Graebner, 2007, p29). The conclusions from

these tables were summarised in a larger table at the end of the chapter. In the cross-case analysis (Chapter 6), 2 tables were used for summarising the findings from each category. While the first table was used for displaying the findings related to supply chain integration to that particular category, the second table was used for presenting the interpretations of these findings from the resource-based view (RBV) perspective. This process was replicated across the 12 categories that were used for comparing and contrasting data from the five cases. Another 2 summary tables for the previous tables were used to display the overall results of the data analysis, making a total of 26 summary tables for presenting the across-case analysis. Importantly, the tables used in case-by-case and cross-case analyses are in a similar format to the table that was used for identifying the theoretical framework constructs in Chapter 3 (i.e. Table 3.8). These procedures were followed in order to demonstrate the objectivity of the process used for analysing the data and developing conclusions from the case study research (Miles and Huberman, 1994).

Barratt *et al.* (2011) reviewed a sample of 169 inductive case studies in the field of operations management and found that 23% of these studies did not state their unit of analysis. Their study suggested that clearly stating the unit of analysis is a significant improvement area for making a difference in the research outcomes and in increasing the level of rigour in case study research. The unit of analysis is the part of the supply chain that is the focus of the study. This could be a single company, two or more companies, upstream or downstream companies in the supply chain. “Most studies in supply chain management have not genuinely explored connected chains of dyadic relationships, and have actually, in the main, been surveys of focal firms. ...it is misleading to label the unit of analysis of such studies as the supply chain” (Harland *et al.*, 2007, p1249). Kembro and Naslund (2014) found that only 4 out of 182 studies on information sharing in the supply chain used the supply chain as the unit of analysis. They suggested that using the supply chain as the unit of analysis is necessary to contribute to the development of the supply chain management discipline. This thesis looks at the supply chains of garment manufacturers, their suppliers and customers as a single unit. Therefore, the supply chain served as the unit of analysis in this case study research.

The findings from the case study research were interpreted using RBV theory. The use of theory from other disciplines in supply chain management research has been called for in recent literature (Defee *et al.*, 2010; Barratt *et al.*, 2011) in order to support the

development of supply chain discipline (Burgess *et al.*, 2006; Liu *et al.*, 2010) and to increase the quality of case study research (Barratt *et al.*, 2011). This thesis draws on the RBV rationale to explain the three levels of supplier, customer and internal integration across the supply chain.

Finally, this inductive research was based on the phenomenological context of the five case study supply chains. Therefore, there needs to be caution when generalising the findings to a wider business community (Dul and Hak, 2008; Ketokivi and Choi, 2014). However, the case study selection criteria and the detailed background information about the participating companies in Chapter 5 together with Appendix F provided a reference to help disseminate the findings to a larger business community. A chain of evidence in data collection and analysis was followed through creating a data base, appendices, tables and figures for the sources of data, and presenting the analysis results in the summary tables.

4.7 Chapter Summary

This chapter has reported on the philosophical and methodological issues adopted for conducting the research. Several philosophical paradigms have been discussed based on ontological, epistemological and methodological issues. As a result, this thesis has adopted the social constructivist orientation which has driven the research strategy. Inductive reasoning was adopted to support the theory-building objective of this research. Qualitative research based on a multiple-case study strategy was adopted to understand the phenomenon of supply chain integration and in order to be able to generalise the findings to Jordanian manufacturers. The breadth and depth of data collected from interviews, documents and observation were presented in this chapter in order to maintain a chain of evidence. The chapter showed that this research adopted a novel methodology through collecting evidence from suppliers, manufacturers and customers across five supply chains. Finally, this chapter discussed how the chain of evidence was controlled in the data analysis stage in order to draw and validate conclusions.

5. Multiple Case Studies: A Case-by-Case Analysis

The purpose of case-by-case analysis is to familiarise the researcher with each case study as an independent entity and allow the unique patterns of each case to emerge (Eisenhardt, 1989; Voss *et al.*, 2002). Despite the descriptive write-ups created at this stage, this is the first step for developing insights (Barratt *et al.*, 2011) from the cross-case analysis (Voss *et al.*, 2002) conducted in the next chapter. The members of each case study supply chain are introduced and an overview of the way they are linked together is provided in the beginning of each case study. As the garment manufacturer in each case study is the focal company and is used to investigate not only external supplier and customer integration but also internal company integration, a detailed description of its internal operations was introduced. This includes a description of its organisational structure, business operations, and range of products and introduction of its supply chain members. See also Appendix F which provides additional information about the focal companies' production operations.

This chapter analyses each of the five case studies based on the theoretical framework constructs. The theoretical supply chain integration framework incorporates three main themes of internal company integration, external supplier integration and external customer integration. Each theme comprises four main constructs being actors' integration, information integration, material integration and technological integration. These constructs, including their lower level constructs were used for discussing the data collected from the five case study supply chains. Each case study included evidence from a focal company being a garment manufacturer and at least one supplier and one customer across the supply chain. Data collected included evidence from interviews, documents and observations. Each case study was analysed individually in this chapter and the details of the data sources were provided at the beginning of each case study. The NVivo Qualitative Data Analysis Software was used for organising, codifying and finding patterns across the data collected from each case study. A detailed list of documents collected from the five case studies is shown and codified with the supply chain integration constructs in Appendix D. These included a total of over 200 documents from the five focal companies, examples included minutes of meetings, operating procedures and supplier and customer contact documentation. The data collected from each case study were empirically analysed by relating these data to the theoretical framework main and lower level constructs and discussing the developed themes.

5.1 Case Study A

This case study consists of a garment manufacturer in Jordan, being the focal company, a supplier in Turkey and a customer in Turkey. The supply chain for Case Study A is shown in Figure 5.1 below.

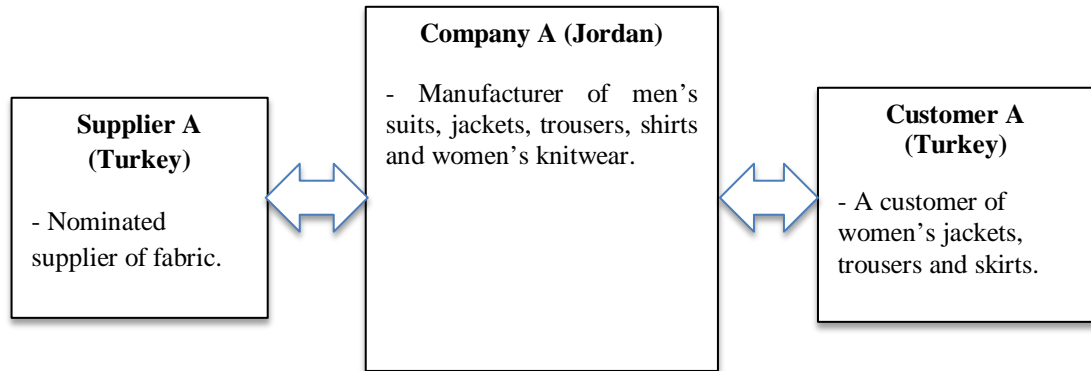


Figure 5.1: An overview of participating companies in Case Study A

5.1.1 Company A

Company A is a manufacturer of men's suits, jackets, trousers and shirts and women's knitwear. The company was established in 1992 as a public share holding company and in 2012 had 1100 employees. It started its exporting activities in 1996 to Europe and by 2012 exported to several countries in the world, with Europe and USA being the most prominent markets. The company's mission was defined as to produce and supply stylish tailored fashion categories to meet the local and foreign demands through well-designed quality products.

Organisational Structure

The company has a Board of Directors and General Manager who were not directly involved in the business operations. The Operations Manager and Finance and Administration Manager are involved in both senior management decisions and business operations. The basic organisational structure diagram for Company A is shown in Figure 5.2 below.

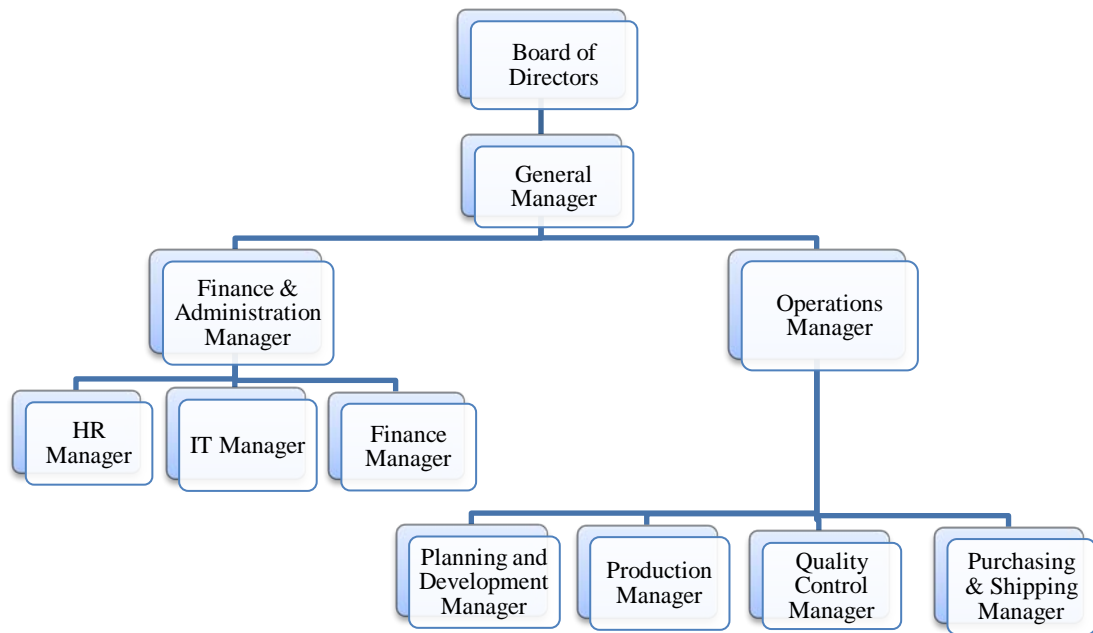


Figure 5.2: The organisational structure for Company A

5.1.2 Suppliers

Company A's major fabric and trim suppliers are located overseas mainly in Turkey, Italy, China and India and there was only one small fabric supplier in Jordan. Around 85 percent of the company fabric and trim suppliers were nominated by customers. The secondary materials such as poly bags, hangers and cartons were all sourced from suppliers who are located in Jordan. One major fabric supplier was involved in this case study and is referred to hereafter as Supplier A. An overview of Supplier A and its business with Company A is introduced below.

- **Supplier A**

Supplier A is a producer of wool fabric based in Turkey with approximately 1650 employees. The company is ranked as one of the top wool producers in the world and the largest worsted wool producer and exporter in Europe with total sales of over GBP 70 million in 2013. The company was founded in 1973 and its products are exported to more than 50 countries around the world with sales offices in Turkey, United Kingdom and Germany. The company has a General Manager who is based in Turkey and four Marketing Managers who are responsible for different regional areas. The company is a nominated supplier by several wholesalers and retailers around the world with the USA, UK, France and Germany being the major markets. However, the company key customers of garment manufacturers are based in Egypt and Jordan.

Supplier A was nominated in 2009 by Customer A to supply Company A with wool fabric for its orders. Supplier A makes approximately 60 % of Company A's purchases of ladies wear fabric, this makes around 8 % of supplier A total sales of this fabric. This makes Company A the top customer for Supplier A in Jordan amongst its three major customers in the country.

5.1.3 Customers

Company A's major customers are high fashion retailers and sourcing companies located mainly in Italy, Turkey and the USA. These customers are known for sourcing high fashion and quality garments from vendors around the world. Company A's customers were similar in that they all nominated the fabric and trim suppliers for their vendors. Company A was chosen by its European customers mainly for having highly an experienced team from Jordan and Europe, the ability to meet high quality production standards and its geographical proximity to Europe. Since the Jordan-US Free-trade Agreement (FTA) was signed in 1996 (see Appendix E), Company A has become an attractive vendor to US customers for its ability to supply free-tax-and-quota garments into the USA as well as the previous expertise of Company A in supplying high quality fashion into the European Market. One major customer was involved in this case study and is referred to hereafter as Customer A. An overview of Customer A and its business with Company A is introduced below.

- **Customer A**

Customer A is a fashion sourcing company for a large number of fashion retailers and wholesalers around the world based in Turkey with approximately 320 employees. It was established in 1996 as a division of a larger service group and is currently sourcing women's and men's garments from vendors around the world with Turkey, Jordan and Morocco being the major sourcing countries. The internal structure of Customer A consists of seven Category Managers, underneath each of whom there is a merchandising, quality and technical team. Customer A nominates the fabric and trim suppliers for its vendors and specifies the types of materials that need to be used for making their garments. The major nominated suppliers by Customer A are known for their high quality service and products and are located mainly in Turkey, China, India and Italy.

The relationship between Customer A and Company A started in early 2009 when the Fashion Speciality Category Manager visited Company A's production facility in Jordan. Since then, Company A has become a vendor of high fashion women's jackets, skirts and trousers for Customer A. For Company A, Customer A is the largest women's wear customer making approximately 60 percent of the total production capacity. For Customer A, Company A makes around 18 percent of the purchases of its speciality fashion category, this comes to around 3 percent of the total company garment purchases. Customer A nominates the fabric and trim suppliers for Company A and specifies the specifications of the materials that need to be sourced from these suppliers to produce a garment.

5.1.4 Case-by-case Analysis: Case Study A

Data collected for this case study involved evidence from several sources across the supply chain. From the focal company, Company A, five major interviews were conducted with the Purchasing Manager, Logistics Coordinator, Operations Manager, Production Manager and Quality Manager. Four follow up interviews were conducted with the Logistics Coordinator, Purchasing Manager, Production Manager and Quality Manager. Direct observations were made during four sites visits to the production facility and managers' offices and thirty internal company documents were collected. From a major supplier, Supplier A, a telephone interview was conducted with the Marketing Manager. From a major customer, Customer A, two telephone interviews were conducted with the Category Manager. Figure 5.3 summarises the respondents and number of interviews conducted across Supply Chain A. Customers such as Customer A give orders to Company A with nominated suppliers such as Supplier A. Therefore, Company A adopted a make-to-order strategy by which raw materials are only sourced after winning an order and making sourcing arrangements with the nominated suppliers.

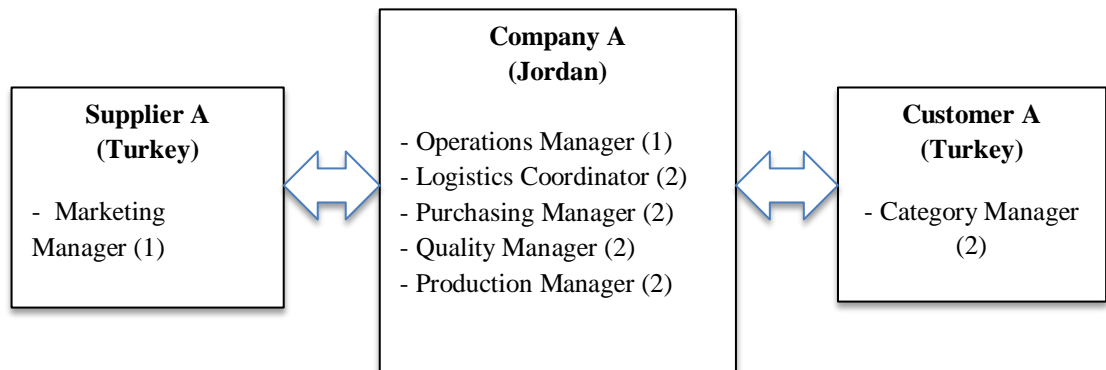


Figure 5.3: An overview of the respondents and number of interviews across Supply Chain A

Internal Company Integration

Internal Actors' Integration

To evaluate the construct of internal actors' integration, a detailed analysis of cross-functional teams, joint planning and shared goals amongst the production and supporting functions was undertaken.

- **Cross-functional Teams**

There were daily, weekly and monthly periodical meetings conducted amongst the production and supporting functions in Company A. The Operations Manager explained:

“There is a weekly meeting amongst the main departments. We discuss a recap for our problems and future challenges for next week. We have also a monthly meeting with the General Manager which we call it Management Review Meeting”.

Moreover, the company conducted a pre-production meeting when there was a new customer order. This meeting encompassed the heads of production and supporting functions to discuss and allocate the production and logistics resources to fulfil an order. Document A-19 showed a customer specification package that was discussed during a pre-production meeting. Document A-9 provided a detailed agenda for a pre-production meeting in which the production plan was discussed by the production and supporting functions. The Production Manager explained:

“There is what we call a pre-production meeting. For any new product we need to produce we arrange for a meeting with production, planning and commercial and quality managers...Whenever there is a new product or style. Even if the styles have changed during the same season we need to meet where there is any change. We

conduct this meeting to ensure that all the needed trims will be available on time and the quality will be controlled according to what is required by the customer. This is also to ensure the delivery of this order will be on time. We discuss as you see from this list; the date, fabric inspection, customers name, product description, production plan, the purchase order details and the garment markers.”

The company also conducted emergency meetings to solve any arising problems. The Purchasing Manager gave an example:

“Upon the arrival of any materials the warehouse department takes a sample and passes it to the work organisation in order to test in cooperation with the quality managers and production lines managers. And they need to decide whether these materials are acceptable or rejected. It could happen that the sample is passed but the bulk is not okay. Then we ask for an urgent meeting for all the main departments to take a decision about these materials and find a solution.”

There were also informal daily meetings amongst the heads of production and supporting functions. This was to deal with any arising daily issues as work progresses.

The Production Manager explained:

“There is a daily meeting but we do not draft its outcomes and we do not consider it as an official meeting. For example, if I have a problem with production I talk to the Planning Manager and ask him to solve the problem and help us in the department. Such things happen on a daily basis.”

The Quality Manager added:

“We have daily meetings to discuss quality issues. This happens between production and quality staff. We try to find the reasons in these meetings for any defects and any quality concerns. We discuss with the supervisors what is happening and what need to be done”.

It appeared from the above discussion that Company A recognised the importance of conducting meetings amongst the production and supporting functions. These meetings seemed to be essential for planning and problem solving during the order development and fulfilment.

- **Joint Planning and Shared Goals**

The Operations Manager explained that the company goals are shared during the weekly and monthly meetings:

“We have a meeting every 3 months which includes the General Manager, Operations Manager, Finance Manager and other head of departments and a group of workers. In this meeting we discuss where are we going and what we need to do in order to meet the expected challenges in the future.”

There seemed to be a clear understanding by senior management as to the importance of synchronising the work of the different functions in order to achieve the company goals.

The Quality Manager explained that:

“...they are all connected departments. All the departments need to work together in order to reach good results. And here we are working together. You could be the best person in the world but you can do nothing on your own... In order to have great results you to get all people and departments working together...the final result is not for one person but for the benefit of everyone. There is cooperation in our company.”

The Purchasing Manager provided an example that demonstrated the importance of the involvement of the different functions together:

“In order to make an order we need to get all departments involved including business development, commercial department, and shipping for example. We need to ask the shipping department about the rules of shipping and we need to keep in touch with the production department if we can produce this specific order with a specific period of time. The decision is taken without consulting other departments when only related to internal issues to the department. However, the head of department or larger division is consulted and aware of what is going on.”

The Production Manager explained that the company has joint planning and interdependence between the production and supporting functions:

"Some orders need specific machines and extra manpower. So the different departments need to meet up including me, as a Production Manager, and we arrange the necessary machines if we decide that it is important for us as an investment for the future as well".

The Category Manager of Customer A explained that Company A was able achieve high customer satisfaction and work with big brands because of the internal collaborative culture that exist in the company. The Quality Manager explained that there was interdependence between the production functions:

"If there are any comments on products by customers I'm the one who receives it first. Basically the client sends it to me and then I have to share with others. So in this meeting I give this information but also we discuss how to solve the problems that we have".

Company A seemed to work in such a way that emphasised sharing of goals amongst the functional departments. The production and supporting functions recognised the importance of joint planning and interdependence.

Internal Information Integration

- **Operational Information**

All sourced raw materials were identified in such a way that allowed access to its details on a real-time basis. The Purchasing Manager explained that the different functions have access to the raw materials details as they arrive in the company and through the different processes through to completion:

“Every item we produce we give an ID. So any information or details about this product will be available to these departments”.

The company internal functions shared information that was important to the other functions. In this regard, the Operations Manager explained that:

"It depends on the importance of the information to the department which needs the information. For example, what we have in the warehouse of stock is accessible by the commercial and operations departments. However, production cannot access it but they can get a report if they need it."

To ensure the quality of information, Company A employed a system of procedures that is based on the documentation of critical information. The Operations Manager explained:

"We try to work on a system of procedures based on which all requests between departments are documented. So the information that is critical needs to be documented. So we are trying to create just in time information system for our work."

The company appeared to have regular sharing of operational information amongst the different functions. Whereas there was some information shared on daily basis through informal meetings and ad-hoc conversations, information was also shared at the formal departmental weekly meeting. Moreover, information was shared when available through emails as well as the information sharing system.

- **Strategic Information**

Much of strategic information such as capacity planning and quality target was shared during the pre-production meetings that were conducted to discuss new customer orders. Documents A-9 and A-19 provided a clarification of the type of strategic information shared between the production functions. The Operations Manager explained:

"If we need to produce 700 units then we will need feedback from production that there is manpower to produce 700 units and that our machines are able to produce 700 units. We need feedback from the commercial department that we have material for producing

700 units and feedback from warehouse that we have sufficient space for 700 units. Such information should always be shared."

The importance of sharing high quality strategic information amongst the functions was well understood. Strategic information shared is usually double checked by the recipient according to its importance. Moreover, the documentation system that the company followed appeared to help ensuring the accuracy and timeliness of strategic information.

There appeared to be regular sharing of strategic information amongst the production and supporting functions. The importance of sharing high quality strategic information was recognised by the company's different functions.

Internal Material Integration

- **Standardised Procedures**

The Quality Manager and Purchasing Manager confirmed that there were identified procedures that helped reduce the amount of inventory held in stock. The Quality Manager stated that:

"There are accurate procedures for managing materials internally from the moment they arrive. We need to follow these procedures".

The Purchasing Manager supported this view and further explained that:

"Every item we produce we give an ID. So any information or details about this product will be available to these departments."

Documents A-5 and A-6 provided a clarification of the procedures adopted to control the materials and the responsibility for each department. The following quote is an excerpt from document A-6:

"Receive the goods from matching area according to the cutting order number and the fabric listed there (in the warehouse); the fabric quantity in the cutting order should be the actual quantity to receive. If one unit is not finished from the cutting order for the indicated fabric, the units should not be received unless the order was urgent and it was approved by the Production Manager and Planning and Warehouse Manager through the Purchasing Manager. The cutting order number should be recorded along with the number of missing units and their sizes."

Company A has clearly identified procedures for managing materials internally from the moment they arrive at the production facility until they become finished garments. These procedures seemed to be understood by all the departments involved in turning raw materials into finished products.

- **Close Coordination**

The company kept a three-month stock of the fabric sourced from the Far Eastern suppliers and less stock of the fabric sourced from Turkey and Italy where the transit-time was shorter. The Operations Manager, Purchasing Manager, Logistics Coordinator and Quality Manager explained that there is a close coordination of material flow activities amongst the internal departments. Through the involvement of first-line workers in reporting any shrinkage in material, Company A was able to maintain a good level of stock control. This was achieved through taking feedback from the workers about any defective yarns and fabrics. Moreover, the production and supporting functions were able to develop a system through which the ordering of fabric from the warehouse was based on finding the best way for reducing the number of fabric rolls which resulted in reduced fabric stock. The Operations Manager explained:

“We did something unique for managing the fabrics internally. We did on our system a method based on which we reduce the number of rolls and recycle the old stock. This system chooses whatever older and its artificial intelligence ability chooses the number of meters in a way that reduces the number of rolls. For example if I need 70 meters and in the warehouse there are 2 rolls one 100 meters and the other one 30 meters then the system chooses both and take the 70 meters and return one roll to the warehouse. In this case we reduce the number of rolls and we use the older rolls... this system enhances our competitive advantage because before we used to have old stocks which are unusable.”

The Production Manager explained that the level of communication in managing material has recently improved although it could still be better. His view was that:

"There is a gap in communication between production and merchandising. For example, the production staff might start producing but they do not know that there is an item that has not arrived yet. However, things are getting better; there is now coordination between purchasing and production, but it could be better than this".

There seemed to be an understanding by the production and supporting functions as to the way material flow was managed within the company. Company A had clearly identified and standardised procedures for managing internal material flow which was closely coordinated by the production and supporting functions.

Internal Technological Integration

- **Information Sharing Systems**

Company A employed an internal information sharing system to share operational information amongst the different functions. The most prominent internal information system is called EMAS. This is considered a traditional Enterprise Resource Planning

(ERP) system which helped connect the different functions together. Document A-3 shows operational information such as raw material details accessed through this system. Another internal information system is the production system which is a simplified version of the EMAS system and was used to show the detailed production processes and updates. The Operations Manager explained:

"We have three information systems. First is the production system which can be accessed by the production and planning and commercial departments. Second is the finance system which is accessed by finance staff, Operations Manager and the General Manager. Third is the HR system which is accessible by head of departments and the General Manager. For example, the Finance cannot access the production system unless they get permission from the production to access as they need to make sure the information is updated and correct before is seen by others. So it depends on the type of information...we have the warehouses system which is accessible by particular persons. Also, we have the EMAS System."

The Purchasing Manager gave an example of how the EMAS was used to facilitate the connection amongst the production and supporting functions:

"Through EMAS we, as the commercial department, make purchase orders. Second, the EMAS is available in the warehouses so all types of material either raw materials or finished products are stored into the EMAS including all its details such as colour, name and description. This system is also linked to the finance department where each item price is stored."

The information sharing system that was used in Company A was viewed as a useful and important tool to keep the business running. The EMAS system appeared to be essential in connecting all the functions together mainly through allowing the access of operational information on a real-time basis. Through this system the operational information such as stock levels, production schedules, work-in-progress (WIP), the level of productivity and order status was visible to all the relevant functions.

- **Communication Tools**

The Purchasing Manager, Logistics Coordinator, Production Manager, Quality Manager and Operations Manager agreed that emails were seen as a major way of communicating amongst all the functions. Moreover, the Operations Manager explained that reminders through Outlook Application were also used for transferring critical information internally. The observation in Company A suggested that emails and phone were effectively used for communication amongst the functions.

External Supplier Integration

Supplier Actors' Integration

- **Long-term Relationship**

The relationship that Company A had with its suppliers seemed to be limited to performing order fulfilment transactions. The Production Manager explained that the company's relationships with its suppliers are limited to performing transactions according to customers' recommendations:

“Most of the suppliers are nominated by customers. For example (name of customer) specifies from who I have to buy the fabrics. I only pay the costs for the suppliers. The customer contacts the fabric supplier and asks them that we need these quantities from a specific fabric material.”

Another quotation by the Production Manager further elaborates on the previous discussion:

“The supplier does not consider us as important because they have a direct relationship with the customers. There is a mutual benefit between the supplier and the customer. For example, Supplier ‘A’ produces materials for Customer ‘A’. Now I will need to pay the supplier the costs of these materials but I cannot negotiate the price with them or even look for another supplier. I have to buy it from that supplier because the customer has a condition that I have to buy from their nominated supplier”.

However, the Quality Manager explained that some customers allow them to suggest other suppliers if necessary:

“We keep changing the suppliers according to the prices they give. You cannot get the same price from all suppliers. Sometimes you can change a supplier from Italy to a supplier in China in order to reduce costs and the customer allows us to do this sometimes”.

The Marketing Manager of Supplier A explained:

“We do not have any investments with them (Company A), we actually serve them based on our relationship with (Customer A). We are nominated by (Customer A) and also have a good relationship with (Company A) but we do not need to have any investments.”

Company A's relationship with its suppliers did not appear to be strategic. The business model of nominated fabric and trim suppliers by final customers seemed to largely affect the nature of the relationship built with the suppliers. The intention of Company A was only to satisfy the customers' needs through ensuring the business transactions with the nominated suppliers were performed as expected by customers. There did not

seem to be also interest in building closer relationships by suppliers. Moreover, there were no defined investments or agreements that explained the relationship commitment between Company A and its suppliers. There was no clear understanding by the Production Manager and Operations Manager as to whether there will be continuity in the relationship with suppliers. For instance, the Operations Manager quoted:

“With the Chinese and Far Eastern suppliers there is a good relationship but with these suppliers; money talks. They are not flexible.”

There did not seem to be any clear evidence of long-term relationships between the company and its suppliers. The relationship with suppliers was determined by the relationship with customers as suppliers were assigned by the company’s customers. Any future commitments with suppliers would depend on the arrangements between the suppliers and customers and not if Company A developed its own relationships with suppliers.

- **Mutual Understanding**

The problem of language difference seemed to affect the company’s communication with their suppliers. This was explained by the Operations Manager and the Production Manager. The Operations Manager explained that:

“...sometimes when we speak to some suppliers and an Asian guy would answer who we cannot understand his English and keep saying OK, OK and as a result they send the wrong item. Even we struggle when we try to explain it to him. Sometimes we send it in writing. Sometimes we send it in the language of the supplier”.

Similarly, the Production Manager supported this view and stated that the company sometimes has a problem of communication with Italian suppliers. However, the existence of an Italian Quality Manager appeared to help make better communication with Italian suppliers.

There did not seem to be an appreciation of the importance of close relationships between the company and its suppliers. When the Production Manager was asked about the degree of honesty and mutual understanding between the company and its supplier he stated:

“I cannot tell because we do not have direct meetings with them. You cannot judge someone based on only emails”.

This quote suggests that there were no close relationships or mutual understanding between Company A and its suppliers. The Quality Manager believed that there is

mutual understanding with suppliers but not to a high level. The Operations Manager differentiated between Far Eastern and European Suppliers. He quoted:

“In the Far East there is no (mutual understanding), only with Europeans... Until now we have never reached the level of having mutual understanding and trust with the Chinese”.

Company A seemed to recognise the importance of mutual understanding in building long-term relationships with suppliers. However, the company seemed to struggle with the Far Eastern suppliers with whom the relationship was limited to daily business interactions. It was not the intention of the company or its suppliers to build closer relationships.

Supplier Information Integration

- **Operational Information**

The company received a wide range of operational information from its suppliers such as delivery schedules and production updates. However, information was not shared regularly but rather when requested from suppliers by Company A. Little information was transferred from Company A to their suppliers. When the Production Manager was asked about whether they share information with suppliers, he stated that:

“Not on a daily basis; however we share information with them (suppliers) in case of defects or failure in quality. We also communicate regarding payments and delivery of materials.”

There is an agreement in the company that operational information shared with suppliers is usually accurate but that inaccuracy might happen due to delivery issues which are usually out of their control. In this regard, the Production Manager stated that:

“...I would say it is 80% accurate. There might be a delay in delivery to reasons that are out of their (suppliers) control.”

The Purchasing Manager explained:

“It could be faulty information that the actual quantities are not conformed to the packing list... there are always mistakes in businesses it could be from their side or from our side. However, this does not happen all the time.”

There was no regular sharing of operational information between the company and its suppliers. Most operational information was shared after the quality inspection had been

conducted. The information shared about delivery and updates seemed to be of an acceptable level of quality.

- **Strategic Information**

Limited strategic information was transferred between Company A and its suppliers including initial forecasting and machinery investment. However, much strategic information was transferred by the customers directly to the nominated suppliers and the intervention of Company A was rarely needed. The Quality Manager explained that the company transferred information related to future orders:

“We tell them that we need to buy a large amount of these materials this year or next season so you need to give us a discount because we are buying huge quantities”.

The Production Manager explained that there was little strategic information shared with suppliers because the interaction happens ahead of time between the customers and their nominated suppliers. When he was asked about whether the company shares market information with suppliers, he answered:

“You are talking about suppliers we have chosen them, but these suppliers are nominated.”

The quality of strategic information shared between the company and its suppliers seemed to be to largely extent accurate. However, where a lack of accuracy existed it did not seem to affect the decisions taken by the company.

There did not seem to be significant sharing of strategic information between Company A and its suppliers. The company transferred strategic information related to future orders only after the needed raw materials for each order had been determined.

Supplier Material Integration

- **Standardised Procedures**

There were no clear material management initiatives between Company A and its suppliers. As most of the company suppliers were nominated, these suppliers were notified of the materials needed by customers ahead of time. The Logistics Coordinator, Purchasing Manager and Operations Manager explained that most of the standardisation of material management procedures was limited to shipping terms. However, Company A had an unwritten agreement with their suppliers to hand over the ready-for-shipping material to its logistics service provider during holidays in Jordan. The Operations Manager explained:

“Sometimes we ask the suppliers to ship fabric to our account with (Name of forwarder) which is useful for us during holidays. (Name of forwarder) ships it for us with no authorisation or any other requirements.”

This was useful to overcome the time difference between the Far East and Jordan where, otherwise, the supplier would wait until the following working day to take permission from Company A before despatching its orders. However, the Operations Manager also explained that the lack of trust with some of its suppliers made Company A experience prolonged procedures in terms of ensuring that the cost of goods were received before the supplier despatched the ordered raw materials. He explained that this lengthened the delivery lead time from these suppliers. The Logistics Coordinator explained that there is collaboration with some suppliers on the consolidation of sourced materials:

“We (Company A) do sometimes consolidation. We consolidate shipments from more than one supplier in one container.”

She commented on this point and explained that such initiatives would reduce shipping costs. However, consolidation required close communication with suppliers and much effort to arrange.

There were limited initiatives which indicated that there was standardisation of material management procedures between Company A and its suppliers.

- **Close Coordination**

Company A arranged for the shipping forwarder to source the raw materials from overseas suppliers based on price, speed and availability. The suppliers might have occasional intervention through giving advice about a specific forwarder or shipping route if requested. However, the predominant relationship in terms of managing material flow appeared to be limited to forwarding materials to the carrier on the agreed date. The Purchasing Manager explained:

“You need to know that 99% of suppliers have nothing to do with shipping. They care about two things which are handing over the materials on the agreed date and they need to know which forwarder they need to hand over the materials to.”

There was no real-time access to material details such as the production plans and stock levels by Company A or its suppliers. Rather, material details were transferred upon request and there was no regular sharing of this type of information. The Operations Manager explained that the company keeps a record of the manufacturing lead time and shipping lead time for each supplier:

“We have data bases for each supplier. For each supplier there is a manufacturing lead time and there is transit lead time. We have this information and keep updating it.”

This explanation supports the view that there was no close coordination and sharing of material information on a real-time basis between Company A and its suppliers. There did not seem to be a clear appreciation of the importance of integration through the efficient and effective management of material flow between the company and its suppliers.

Supplier Technological Integration

- **Information Sharing Systems**

Company A did not have a connection with its suppliers through any type of information sharing systems. The Operations Manager, Production Manager and Purchasing Manager explained that there was no dedicated information sharing systems with suppliers. The Observation in Company A suggested that there was no understanding of the importance of such systems with suppliers. None of the respondents identified any information sharing systems and all their answers and discussions about technological integration were focused through the communication tools discussed below.

- **Communication Tools**

The company technological connection with its suppliers was limited to communication tools being emails, phone, and fax and less common, conference calls. Through email and phone communication the company was able to maintain a regular contact with its suppliers. The Purchasing Manager explained:

“We have been dealing with them (suppliers) for long now. It is strong through phone and email. Although there might be a role for visits but communication through email and phone makes a good relationship. It works for us with them.”

However, the Production Manager had a different view and explained that emails are not enough to build a close relationship:

“... We do not have direct meetings with them (suppliers). You cannot judge someone based on only emails.”

Company A appeared to use communication tools effectively for making a regular contact with its suppliers. This technological connection was viewed as appropriate providing that the relationship with these suppliers was limited to performing day-to-day transactions.

External Customer Integration

Customer Actors Integration

- **Long-term Relationships**

Both the company and its customers seemed to appreciate the importance of having a close relationship and mutual understanding. The Quality Manager explained that there is a close relationship between the company and its customers based on close contact and advice sharing:

“They (customers) visit us in here. They prefer to visit us in order to see the production lines... they give us suggestions sometimes. They also discuss the future plans, orders and prices. The technicians also give some advice and get feedback about the production process and give suggestions. Their senior management even comes in here and make a tour.”

The Purchasing Manager confirmed this view:

“We (Company A and its customers) discuss our production plans and make sure that we have the capacity for at least the next six months to one year including production lines and manpower”.

The Category Manager of Customer A added to these views:

“We have been in a close relationship with them (Company A) since we started the business... there is a dedicated person from our side to deal with them and they also have a dedicated person for our account to handle all the communication. And they have a technical person as well... They (Company A) visit us twice a year and we visit them approximately four times a year. So we make sure that we meet at least once every quarter... there is sharing of advice and problem solving and review to the procedures we have with them. In general, we discuss the current status of the business, what we have done, we discuss the problems we currently have and what we are going to do in the next period of time.”

There were technological and physical dedicated resources between the company and its customers. Documents A-2, A-4, A-12 and A-13 showed the technological investment of the EDI systems that the company had with two of its major customers. The Operations Manager explained that there are some major customers whom the company has dedicated resources with them. The Quality Manager explained that starting with a new customer needs investments in the relationship which makes its termination costly:

“...starting with a new customer needs investment in machinery or process or space; so we have commitment and it is easier to stay with the same client.”

The Production Manager confirmed that there is commitment to the relationship between the company and its customers. However, he was more realistic and explained

that the company struggled previously from capacity underutilisation due to business circumstances. These circumstances might be stronger than the relationship commitment. His view was that:

“There is commitment, yes. However, you never know what is going to happen. For example when the economic crisis happened in 2009 we had to shut down 4 production lines because one of our major customers in the USA had a drop in their sales. There are no contracts or agreements that the customer must compensate us if the volume of business decreased or they have to work with us for 10 years for example. There is no such thing”.

The technological investments and historical dependence between the company and most of its customers seemed to have a positive impact on the relationship continuity.

- **Mutual Understanding**

The Operations Manager explained that there is a mutual understanding by the company and its customers:

“There is a mutual understanding of the nature of the business. For example, if one of our customers faces a problem in sales they might ask us to postpone or delay producing some orders. As a result we do this though this might affect us. Likewise, if I have problems for example because of a drop in capacity from one of the customers which makes a gap in our production, so if I need extra capacity, I can ask other customers and they usually answer positively and give us more orders”.

Similarly, the Logistics Coordinator asserted that there is appreciation of the importance of the relationship between the company and its customers:

“Sometimes if you need to delay or postpone the delivery of an order they respond positively. If there wasn't a good relationship they would not accept or might say ship it by air.”

The Quality Manager, Operations Manager and Purchasing Manager explained that there were no communication difficulties between the company and its customers because of the language barrier. The Operations Manager explained that the existence of the Quality Manager who was in regular contact with Italian customers facilitated communication with these key customers. The relationship Company A had with its major customers seemed to be close and strong. Mutual meetings were conducted regularly on an annual and monthly basis in order to plan for the coming seasons but also to ensure business is running as planned.

The presence of mutual understanding in the relationship with customers was highlighted by most of the respondents. For example, the Quality Manager stated that there is trust between the company and its customers:

“I trust them (customers) and I believe that they trust us. If there is no trust then the business will not go on for long.”

The Category Manager of Customer A explained that the relationship with Company A was built based on mutual understanding:

“There is a mutual understanding between senior management from both sides (Company A and Customer A). Even if we have problems we discuss them on a daily basis... When we take information from (Company A) we use it directly and we use it without future investigation because there is confidence. We would not spend lots of time correcting it and vice versa when they receive information from us. So this is the benefit of having trust and mutual understanding in the relationship.”

The Production Manager confirmed that there was mutual understanding between the company and its customers. However, he felt that trust should not exceed a particular level:

“There is trust but there are things that I do not prefer that the customer will know all the small details about my production facility. I do not want them to intervene in every small detail”.

There seemed to be an understanding as to the importance of mutual understanding in the relationship with customers.

Customer Information Integration

- **Operational Information**

Documents A-2, A-11, A-16, A-17 and A-20 showed operational information being shared with customers such as delivery information, order status, shipment status, production plans and quality updates. The Quality Manager explained that Company A shared technical information on a regular basis with customers for the benefit of the relationship. He stated that the company shares:

“Technical information; every customer has different needs. We share several specifications and suggestions. In our field 1+1 is not always 2.”

The Category Manager of Customer A explained:

“We share information at the different stages of development, costing, approval, production follow up and shipping. So we share daily information during these four stages of an order. So there is always communication and updates during these stages... they (Company A) send us the details of the shipment including details, colours and quantities. If there is anything wrong the system would give you that there is an error... there is high quality and visibility of information. However, we always have a low percentage of errors from our vendors.”

The Operations Manager believed that the accuracy of information shared with customers is relatively good at around 90%. In order to ensure the quality of shared information, Company A requested its customers to provide email delivery acknowledgment and feedback on the information upon receiving it. The Operations Manager explained:

“We usually ask our customers and even suppliers to give us feedback. They should confirm that they have received the information. This is because problems happened previously because of disagreement on whether information has been received or not so we asked them to confirm information received via email.”

The company shared significant operational information with its customers. This information seemed to be of a high quality.

- **Strategic Information**

Strategic information was shared between Company A and its customers every 3-6 months in order to plan production capacity. The Operations Manager explained:

“Our policy and our plan with all our customers is that we should have at least six months vision ahead of time for capacity for each customer. And we should receive confirmation of capacity at least 3 months ahead of time. This is quite difficult for some customers but this is our policy.”

The Purchasing Manager supported this view and stated that:

“If it is strategic information we share it 2-3 times a year through major meetings based on which we discuss our goals...we discuss the current season, its problems and successes. We discuss also the future business, where are we going. What are the expected styles, what the prices is going to be. We discuss all these things... We discuss our production plans and make sure that we have the capacity for at least the next six months to one year including production lines and manpower.”

The Operations Manager commented on the accuracy of strategic information shared with customers:

“... At the planning level some customers have information accuracy of 100%. For other customers they keep changing. They even change major things...They might change something at the last minutes which means that we might lose opportunities.”

The Category Manager of Customer A provided a quote which explains that there is sharing of strategic information and that there is an understanding of the importance of the information shared:

“During particular periods of the year we have high levels of orders but after this particular period we would have lower quantities and orders. So what (Company A) have done is that they arranged dedicated production lines for us. The problem with dedicated lines is that it is difficult to handle the business appropriately. For example, if

they have dedicated a production line which produces 1000 pieces and we order the following month 30,000 pieces and another month 5,000 pieces then this would be a problem for them... Therefore, what we are trying to do now is supplying them with a longer-planning and forecasting which would help them decide whether to take orders from other customers to fill the underutilised production lines.”

The company recognised the importance of regularly sharing high quality strategic information with its customers. Strategic information was shared mainly during the customers’ visits and monthly meetings with customers every six months. The most frequently shared strategic information included future sales orders and capacity planning. However, there were occasional order amendments by a few customers which caused discrepancies in Company A’s capacity plans.

Customer Material Integration

- **Standardised Procedures**

Company A had standardised procedures for shipping of finished garments to its customers. These procedures were usually decided by their customers who nominated forwarders for shipping finished garments from Company A. When the Purchasing Manager was asked about the possibility of suggesting different forwarders, he answered:

“We tried this. However, they cannot change the forwarder because they are using them with their vendors all around the world”.

The Production Manager supported this view and explained:

“They (forwarders) are nominated by customers. For example, there is a forwarder who is assigned by (customer name) though it is expensive and we have a cheaper one...The forwarder of (customer name) is too bad... we met with (customer name) senior management and we suggested them cheaper shipping prices. However, for them they look at it from a different perspective.”

Documents A-5 and A-6 clarified that Company A has identified instructions for managing material flow with customers. The first paragraph of Company A’s dispatching procedures in Document A-5 reads:

“Before issuing a Performa Invoice, the Customer Representative handling the client’s order would consult the Logistics Officer on delivery terms if in doubt. The Logistics Officer provides the cost of each shipping mode. A copy of the Performa Invoice is sent to the Commercial Department from the customer once they are signed, containing shipping mode.”

This means that Company A had identified procedures for despatching materials to its customers. Moreover, customers had clearly identified procedures for sourcing materials from Company A.

- **Close Coordination**

There was no real-time access to material details between Company A and its customers and such information was mainly transferred through information sharing system and communication tools. However, the Purchasing Manager, Logistics Coordinator and Production Manager explained that the company has a good level of coordination of materials with customers. For instance, the Production Manager stated that:

“There is an agreement always between us and them on the delivery date. On the delivery date I send a packing list to the customer which includes the shipments contents we are sending. If the shipment cannot be shipped on the agreed shipping date we will need to update them. Then either they confirm it or not. If they do not confirm it we need to ship it via air.”

The view of the Category Manager of Customer A was that:

“Generally, there are no problems but from time to time they could say that the vessel will not leave on a specific date but it will leave on a different date or through a different port. It is a general problem with all the vendors. It is not only (Company A) problem... they cannot change the forwarder. They have to use our nominated forwarder. We are using this forwarder for more than one vendor. It is not easy for us to change it.”

The Logistics Coordinator explained that the close relationship based on mutual understanding helped the company achieve higher customer material integration:

“Sometimes if you need to delay or postpone the delivery of an order they respond positively. If there wasn't a good relationship they would not accept or might say ship it by air.”

Company A seemed to have a reasonably good coordination with its customers in terms of managing inventory levels. The way the company worked with its customers in managing material flows was largely affected by the customers' procedures. The close relationship between Company A and its customer seemed to enhance customer material integration.

Customer Technological Integration

- **Information Sharing Systems**

The Operations Manager explained that the company shared operational information with the major customers through EDI systems. He stated:

“With this customer (customer name), the business is cut and make. So they ask us to enter materials we get at their system as inventory and we have access to this inventory. They have such system with all vendors working with them... we have an investment for this as well. We got a special printer and barcode reader and a software package which is specialised in downloading their system... Some customers have portal systems on the internet who give us a username and password and we enter information on this website as the customer needs it. This includes logistics information and production information.”

The Production Manager explained that the EDI system synchronised information with customers. The Logistics Coordinator further explained that:

“Every customer provides a username and a password. The customer can know about what is coming for them before materials arrive including all details of the shipment and order... This would make things more systematic at their companies. I think it is connected to their warehouses and stores.”

The Category Manager of Customer A explained:

“There is a system which connects us with them (Company A) and they can fill the information through the website. They can upload all the product details and we receive a notification of it. They can also enter the price information on this system. This makes a visibility of what is going on... The technology we have through the website is really great which connects us with all our vendors. And we have the pricing system as well.”

Document A-31 showed that Company A used several EDI systems for connecting with its customers such as WebSphere Portal and BOSaNOVA. The BOSaNOVA system was directly linked with the internal ERP system of one of Company’s customers which facilitated sharing of timeliness information. Documents A-2, A-4, A-12 and A-13 showed the EDI system that technologically connected Company A with its customers. The company benefited from integrated and web-based EDI systems for sharing documents, production and logistics information with major customers.

- **Communication Tools**

The Logistics Coordinator, Production Manager, Quality Manager, Operations Manager, Purchasing Manager explained that Company A used several communication tools for information sharing with customers including email, phone, conference calls and fax. The observation in Case A suggested that there was a regular use of emails for communication with customers. The Purchasing Manager explained that in addition to emails the company used conference calls regularly with its customers. Documents A-11, A-14, A-21 and A-22 provided evidence on the effectiveness of email communication for making a regular contact and sharing operational information with customers. The Category Manager of Customer A explained:

“All is through emails and the website. Email is good however; there are other technologies that would make visibility and efficiency even better.”

Company A appeared to technologically share information with its customers through mainly email and less often phone, fax and conference calls. Email was seen as an efficient and effective medium for information sharing. However, there was recognition that email is not sufficient and information sharing systems would enable higher visibility.

5.1.5 Case Summary

Table 5.1 shown below provides a summary of how Company A integrated internally amongst the production and supporting functions and externally with its suppliers and customers.

		Actors	Information	Material	Technological
Supply Chain Integration - Case A	Internal Company Integration	Periodical weekly, monthly and annual meetings, pre-production meetings, informal daily meetings, problem solving, joint planning and shared goals.	Full access to information on a real-time basis, high quality information.	Smooth material flow, low stock levels, real-time access to stock levels and WIP.	ERP system, shared folder through internal server, communication tools: email and phone.
	External Supplier Integration	Nominated, no periodical meetings, no dedicated resources, communication difficulty, lack of mutual understanding.	Infrequent sharing of operational and strategic information, no real-time access to information.	No dedicated resources, no inventory management initiatives. Some consolidation efforts.	Communication tools: email, phone, fax, video conference call.
	External Customer Integration	Periodical meetings, on-site based quality representatives, technological investment, dedicated customer service, and mutual understanding.	Intensive and regular sharing of operational and strategic information, high quality information.	No dedicated resources but highly identified shipping procedures, some efforts of coordination.	Integrated EDI, web-based EDI, communication tools: email, phone, fax, conference call.

Table 5.1: A summary of integration across Supply Chain A

Company A seemed to have a close coordination between the production and supporting functions. There were identified and standardised procedures for interaction between departments. Supplier integration appeared to be affected by the model of nominated suppliers by customers. Company A had to adhere to the instructions determined by customers on how to source raw materials. For customer integration, Company A built a close relationship with its customers. There appeared to be a mutual understanding of the relationship, regular sharing of information and close coordination of material flow.

5.2 Case Study B

This case study consists of a garment manufacturer in Jordan, being the focal company, a supplier in China and a customer in the USA. The supply chain for Case Study B is shown in Figure 5.4 below.

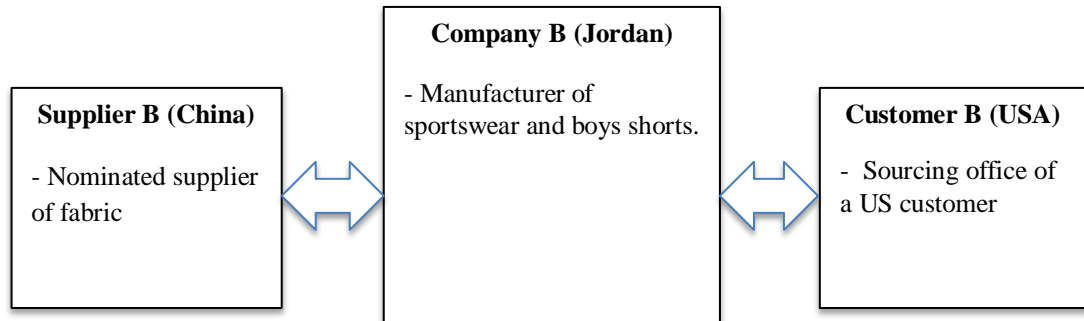


Figure 5.4: An overview of participating companies in Case Study B

5.2.1 Company B

Company B is a manufacturer of underwear, sportswear and boys shorts located in a major industrial zone in Jordan. The company is classified as a large manufacturing company consisting of 1200 employees. It was established in 2006 with a single production facility and three years later a second production facility was added to support the company operations. The major selling market for Company B is the USA making around 95% of the company's market share.

Organisational Structure

The company has a General Manager whom underneath, there are a Commercial Manager, an Operations Manager, and Finance and Administration Manager who report directly to the General Manager. Underneath each of these departments' managers there are smaller teams who are in-charge of different responsibilities. A simplified organisational chart for Company B is shown in Figure 5.5 below.

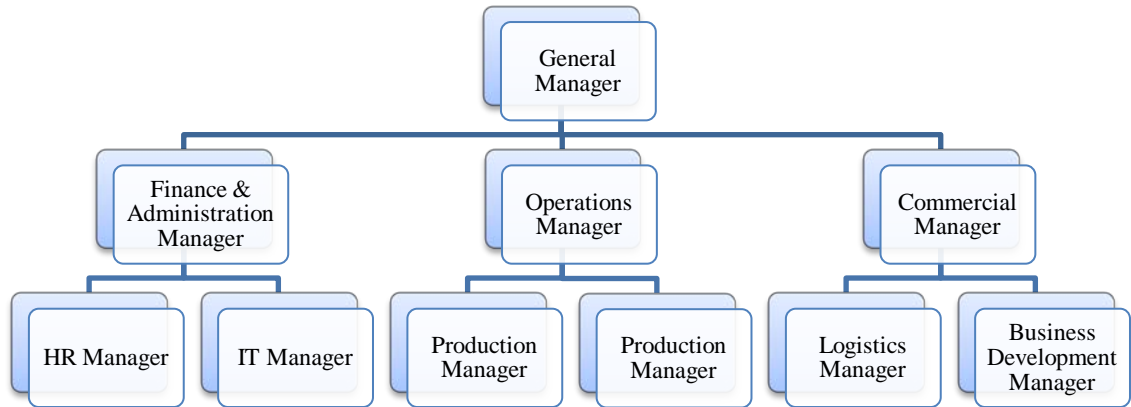


Figure 5.5: The organisational structure for Company B

5.2.2 Suppliers

Company B insources all of its primary raw materials of fabric and trim from nominated suppliers located overseas with China, Taiwan, India, Korea and Dubai being the key supplying locations. For the supply of secondary materials such as poly bags, hangers and cartons, the company depends on Jordanian suppliers who are mainly located in the northern and central Jordan. One major fabric supplier was involved in this case study and is referred to hereafter as Supplier B. An overview of Supplier B and its business with Company B is introduced below.

- **Supplier B**

Supplier B is a large-sized fabric producer located in Hong Kong, China with approximately 600 employees. The company was established in 1997 and is specialised in producing synesthetic textile fabric such as nylon and polyester fabrics. It has a single production facility which includes circular and flat knitting, dyeing and finishing operations. Supplier B is a nominated company of several garment buying houses around the world with Turkey, Far East, Jordan and Egypt being the key markets.

Supplier B is a nominated supplier for Company B by Customer B since 2010. It supplies Company B with polyester and Jersey fabrics based on pre-arranged agreements with Customer B.

5.2.3 Customers

All Company B production is exported to international markets with the US market making around 95% of the sales taking advantage of the Free-trade Agreement (FTA) between the US and Jordan. All of the company customers are classified as large-sized companies who are involved in either retail or wholesale garment businesses. Company

B's customers were similar in that they all nominated the fabric and trim suppliers for their garment orders. The company established a sourcing office in the USA to overcome the time zone difference and facilitate communication with the customers of its largest market. One major customer was involved in this case study and is referred to hereafter as Customer B. An overview of Customer B and its business with Company B is introduced below.

- **Customer B**

Customer B is a global retailer of apparel essentials including sportswear, women's, men's and kids' underwear, socks and casualwear. It was established in 1965 as an incorporated company in the USA and has around 50,000 employees. It operates a buying office in Jordan in order to improve the communication levels with its five vendors in the country. This buying office which was established in late 2011 has a General Manager, a Purchasing Representative, and three Communicators. This office is linked with the US headquarter through conference calls and email communication as well as mutual visits. Prior to establishing the Jordan Buying Office, the orders of Jordan's vendors were handled through Customer B's office in Turkey which was shut down in 2011.

The company was originally a customer of underwear for Company B and currently is a customer of sportswear. It has been dealing with the Company since year 2005. The relationship is moderated by the company buying office in Jordan. Out of its 30 production lines, Company B has allocated eight production lines for Customer B's active wear and underwear products in year 2012. This makes around 27% of Company B total production capacity.

5.2.4 Case-by-case Analysis: Case Study B

Data collected for this case study involved evidence from several sources across supply chain B. From the focal company, Company B, six major face-to-face interviews were conducted with the Merchandising Manager, Logistics Manager, Operations Manager, Business Development Manager, Information Systems Manager and Administration Manager. Two follow up interviews were conducted with the Logistics Manager and Administration Manager. Direct observations were made during five sites visits to the production facility and managers' offices and sixty internal company documents were collected. From a major supplier, Supplier B, one telephone interview was conducted

with the General Manager. From a major customer, Customer B, two face-to-face interviews were conducted with the General Manager and one interview with the Purchasing Representative of the sourcing office in Jordan. Figure 5.6 summarises the respondents and number of interviews conducted across Supply Chain B. Customers such as Customer B give orders to Company B with nominated suppliers such as Supplier B. Therefore, Company B adopted a make-to-order strategy by which raw materials are only sourced after winning an order and making sourcing arrangements with the nominated suppliers.

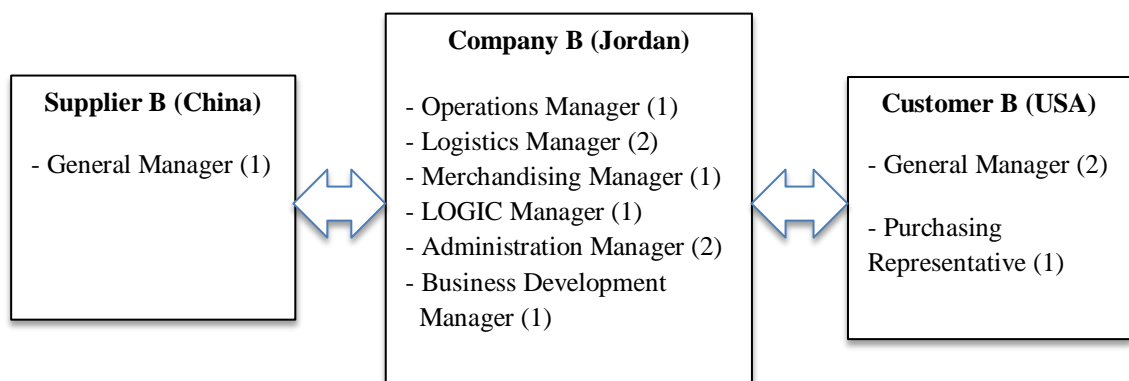


Figure 5.6: An overview of the respondents and number of interviews across Supply Chain B

Internal Company Integration

Internal Actors' Integration

- **Cross-functional Teams**

There were no periodical meetings conducted at Company B, rather; they were only arranged when needed. However, a pre-production meeting was conducted whenever there is a new customer order, usually at the beginning of each season. Documents B-55 and B-56 are specification packages which were discussed at a pre-production meeting. Consequently, follow up meetings were arranged during the order fulfilment if needed. The Merchandising Manager explained that:

“...There is a meeting called pre-production meeting. This pre-production meeting is a cross-functional meeting where one of the merchandising team is there, a technical member, operations and quality members are there. These 4-5 people sit together and discuss all the critical operations for a product to be made... sometimes we might need another meeting so we schedule another meeting. There are no scheduled meetings; it is when it is required”.

The Logistics Manager explained that there was an annual meeting:

“There is usually a plan at the beginning of each year. To develop this plan, there is a meeting which includes the Merchandising Manager, Production Manager, the General Manager and the Production Manager who meet at the beginning of each year”.

However, the company did not conduct any other types of meetings unless there was a need for follow up meetings which were arranged based on the business need.

- **Joint Planning and Shared Goals**

There was recognition by senior management of the importance of collaboration amongst the different functions. The company’s respondents asserted that without collaboration and coordination amongst the functions, achieving the company goals would not be possible. The Business Development Manager explained that the company encourages sharing knowledge and ideas amongst the different functions and understanding interaction with the other functions:

“Every employee has details and procedures which they need to work based on... everyone knows the goals of (our company) but they cannot explain it to others very well... we try as much as possible to do it (knowledge sharing). However, our main intention is that all departments understand the work of other departments... senior management is completely involved in all details and always supports this idea (collaboration amongst departments)”.

Stressing the importance of interdependency between the functions, the Administration Manager stated that:

"...all departments are connected and if any mistake happens at one of the departments this will affect the other departments."

It was recognised by Company B respondents that interdependence between the functions is essential to achieve the company goals. The involvement of senior management demonstrated the importance of internal collaboration through ensuring that the different functions worked towards achieving the company goals.

Internal Information Integration

- **Operational Information**

The operational information shared amongst the production and supporting functions included raw materials, work-in-progress and finished garments stock levels, production plans, production schedules, order status, shipment status, materials needed, weekly work-in-progress report and the daily production report. The later explains the number of garments produced, status and the number of packed garments. Documents provided

a useful clarification of the operational information shared amongst departments. For instance, Documents B-41, B-42, B-43, B-44, B-45, B-45 and B-58 are examples of production reports that were shared between the production and supporting functions regularly. Document B-57 showed communication that contains the level of stocks. Documents B-40 and B-48 contained operational information regarding customers' account that was shared on a weekly basis.

The Logistics Manager provided an example of the importance of sharing the operational information amongst the production and supporting functions:

“If I need to ship a shipment from China to Jordan via air I will need to check with the production department and planning department to know when they need the shipment to be in the production facility. Based on this I can arrange and decide the shipping mode. So I need to have enough information from other departments so that I can decide and do my job.”

The LOGIC Manager was involved in revising the information before it gets entered into the LOGIC system and becomes accessible by the production and supporting functions. He explained:

“It is important when dealing with the LOGIC (the internal ERP system) that the information entered is accurate otherwise all information will be incorrect. So part of my job is to make sure that everyone enters accurate information... there are folders for merchandising and planning on the server that I benefit a lot from. If there is a customer purchase order, anything I receive from production or cutting I need to double check it because there might be a human error either in sewing or cutting, so when I use the shared folders I can make sure if the information is accurate or not.”

There was significant sharing of operational information amongst Company B production functions. Operational information was shared through email, the company computer package known as LOGIC, the company server and the informal daily interaction.

- **Strategic Information**

Examples of strategic information shared amongst the production and supporting functions included information related to expansion in the production facility, sales increase, production capacity and new Standard Operating Procedures (SOPs). Much of the strategic information was shared during the pre-production meeting explained in the previous section. Documents B-29 and B-30 show capacity information by customer and product category that was communicated between departments every six months. Documents B-1, B-2, B-3 and B-27 provided examples of SOPs that the production and supporting functions needed to follow for a specific period of time.

In order to ensure the accuracy of information, a documentation system of critical information was followed. Moreover, the heads of departments tended to double check the information shared as they believed its inaccuracy might result in taking incorrect decisions. For example the Business Development Manager stated that:

“... I always have my own checkpoints to ensure the information provided by other departments is accurate”.

Strategic information was shared amongst the different functions mainly through the pre-production meeting, and monthly plans and, less common, memorandums. The strategic information shared amongst the functional departments was considered, to a large extent, as accurate, timely and easy to use.

Internal Material Integration

- **Standardised Procedures**

Company B followed a make-to-order production strategy which resulted in low work-in-progress (WIP). The company kept 5% of fabric and trim as a buffer stock for any possible quality failure. However, since all fabrics suppliers were located outside of the country, the company needed to order materials around 6-8 weeks in advance. Once the raw materials including fabric and trim were received, their details were entered into the LOGIC system and the company server. This allowed the different departments to have access to the status of materials on a real time basis. Documents B-41 to B-46 showed that material information was updated on a daily basis and distributed to the production functions. These were daily production reports which contained information about WIP and finished garments.

Company B had identified procedures for managing the flow of material between the production functions (Documents B-1, B-2, B-27 and B-58). Documents B-33 to B-38 showed summarised studies that were conducted on the inbound lead time and outbound lead time. These summaries were available to the production and supporting functions which made them understand when materials will be in-house and when garments needed to be ready for dispatch. The Business Development Manager explained:

“Every employee has details and procedures which they need to work based on... the merchandising team supply the production lines with the materials needed for the next one or two weeks. The planning department knows about this plan. Based on this plan the planning department coordinates with the production lines the materials needed for each line. Then they start pulling these materials from the warehouse once arrived. So the process starts from the merchandising to production team who order materials from the warehouse... We conduct inventory studies at the end of each year. This is the

regular checkpoint. Another checkpoint is done through merchandising departments who can check the available inventory once the order is produced.”

Generally, Company B had standardised procedures for managing material flow amongst the production and supporting functions.

- **Close Coordination**

Document B-57 showed an example of communication between the departments about the details of fabric in stock and the needed action based on this update. The Merchandising Manager explained how the different departments worked together to manage material flow internally. He gave an example of how the commercial, production and operations departments were involved in material flow management:

“...for example, if elastic consumption based on which we purchase the materials was 1 yard but found that it is $\frac{3}{4}$ yard then the operations team will get back to the commercial team and ask not to order based on 1 yard but to order based on $\frac{3}{4}$ yard. This is how we manage it. We go to the industrial engineering department and tell them that you have to revise the document and keep it on the share drive. This is an example of how we control material flow.”

All the company respondents explained the importance of the LOGIC system in controlling the inventory internally and improving the internal material flow. For example, the LOGIC Manager explained that the LOGIC system helped allocate the purchase orders and make the necessary calculations for ensuring all materials needed for production are available. However, the Operations Manager believed that the information sharing system used for managing materials flow internally could be better if it was customised to the company operations. His view was that:

“It (the LOGIC system) is meant to be for the garment industry but the problem is that in every continent the garment industry is being run in different ways... in South America they stock fabrics, once the orders come they start making... but we do not stock fabric... it is not customised”.

There seemed to be an understanding by Company B to the importance of coordination between the production functions in managing material flow.

Internal Technological Integration

- **Information Sharing Systems**

Company B employed the information sharing system, LOGIC between the different functions. The Administration Manager described this system:

“It connects all departments together. It connects warehouses, production, cutting and shipping... once the material arrives in-house its details gets entered to the LOGIC system.”

Every department has access to LOGIC within its speciality. Stock levels, production plans, production reports, shipment status, order status, raw material details, and garment details can be found on this system and accessed by the relevant departments. The LOGIC Manager clarified some aspects of this ERP System:

“Through LOGIC you can allocate any purchase order and check if all the materials for this order are available. If you have excess then it is deducted from the next PO. If you have a shortage it can be discovered by the LOGIC. This happens at least two weeks before putting the materials through for production... All clothing companies use similar systems but it depends on the quality of the input.”

The Logistics Manager and Merchandising Manager also had a shared drive through the company servers on which some documents were kept. The Merchandising Manager described the LOGIC and share drive systems in the company:

“Different companies have different tools. Our company uses two kinds of tools one is an ERP system and the other one is the share drive. For example, we try to keep the customer purchase orders, customer orders, planning sheets; bill of material, warehouse information in the system. These are necessary for each department to perform their duties”.

The LOGIC system and the shared drive allowed full access to information between departments. Significant operational information can be accessed through LOGIC which was found to be a traditional version of an ERP system.

- **Communication Tools**

The company used several communication tools such as emails and phone for day-to-day communication amongst departments. Documents B-40 and B-48 showed that conference calls were used as a medium of communication with the company regional office in the United States. Emails were seen by the company interviewees as a major way of information sharing and communicating amongst the different departments. Document B-57 showed internal communication by email between the production functions departments. Moreover, Documents B-41 to B-46 showed daily production reports that were shared via email between the departments.

External Supplier Integration

Supplier Actors Integration

- **Long-term Relationship**

There were occasional visits by suppliers to Company B when there was more than a garment manufacturer to visit in Jordan. The Merchandising Manager explained:

“We are in a close contact with our suppliers because we deal with them on a daily basis over the phone and via emails. We do not meet with them because they are not here. Carton and poly bags suppliers are here but all other suppliers are in the Far East and many other places in the world but not in Jordan. So we do not get the opportunity to meet with them very often unless they come to visit this part of the world.”

The Operations Manager explained that the relationship with Company B suppliers is limited to performing the day-to-day business transactions:

“We just ask for quantities, rates and payments; that’s the relationship we have with them (Suppliers)... we share things related to our dealing with them. That’s all... some suppliers from Dubai and India visit us when they come in a tour in the region... this happens every 2-3 months.”

From the above discussion, the company relationship with its suppliers did not seem to be strategic. The business model of nominating the fabrics and trims suppliers by customers appeared to affect the nature of the relationship built with suppliers. The intention of Company B was to satisfy their customers’ needs through ensuring that the business transactions with suppliers were performed as recommended by customers.

The relationship commitment with suppliers was affected by the relationship with customers. Any future commitments with suppliers were arranged first with the customers who nominated these suppliers. The Merchandising Manager explained that their suppliers had made sacrifices in the past for the benefit of the relationship:

“In some cases when they are a bit late we ask them to airfreight the fabrics to us at their expense, which is a huge expense. In this business no one has the margin to bear any extra costs. It is a very tight costing structure. Sometimes they do this for the mutual benefit of the long-term relationship and for the continuousness of business with them”.

The Logistics Manager supported this view and stated that:

“We always try to build a good relationship with them as long as we need this supplier. Sometimes we ask for quantities higher than what I have ordered already. Even when we order small quantities which are sometimes lower than the minimum order quantity, they ship it to us... sometimes they might airfreight a shipment and pay themselves for it just to keep the relationship.”

Meanwhile, the Merchandising Manager believed that it was impossible to make future commitments in terms of investments with the Far Eastern suppliers:

“...there is not very much can be done between this and that part of the world other than only communication via emails; that’s it. We are only following the same standards they are following”.

This later view was supported by the Business Development Manager who clarified that it was difficult to have dedicated resources with suppliers:

“I believe with suppliers it is not worth it... because the suppliers are many and every supplier is a key supplier to us. If it was with customers it would be easier because we have got only eleven big customers in total. But we cannot do it with suppliers”.

The Business Development Manager explained that there are no formal contracts between the company and its suppliers:

“It is not commitment in terms of contracts and documents but we have personal long-term relationships with our suppliers which is good for any garment manufacturer.”

Company B did not have any dedicated resources with its suppliers which may indicate future commitments. However, because the relationship appeared to be characterised by achieving business transactions smoothly, commitment exists as long as these suppliers remain nominated.

- **Mutual Understanding**

The company seemed to have difficulty in communicating with its Far Eastern suppliers because of the language difference. When the LOGIC Manager was asked if there are any problems with suppliers because of differences in language, his response was:

“Sure there is. This happens with the Far Eastern suppliers especially the problems of language and time difference.”

The Logistics Manager supported this view:

“We had problems related to language especially with Chinese. However, we got used to that Chinese cannot speak English but can write it. We need to repeat the word five times for them. They depend on email communication which I think they translate it; I am serious. We need to send them something written so that they can understand it.”

The Merchandising Manager elaborated on this and explained that:

“...there is a communication problem between us and the Chinese suppliers. They do not encourage plenty of communication; they encourage brief information and less communication. They try to send information in one email as a capsule. They like it this way.”

Recognising the importance of mutual understanding in their suppliers' relationships, the Operations Manager stated that:

“Mutual understanding is there with everyone. Without mutual understanding we cannot run the business.”

The LOGIC Manager supported this view:

“...if the supplier advises me that there is a carrier who charges USD 2200 instead of USD 2500 then we take the advice... the supplier intention is to stay with us; I do not think they would give any incorrect information.”

The Logistics Manager explained that Company B counts on its suppliers doing what is beneficial for the relationship:

“We always try to build a good relationship with them as long as we need this supplier. Sometimes we ask for quantities higher than what I have ordered already. Even when we order small quantities which are sometimes lower than the minimum allowed order, they ship it to us... sometimes they might airfreight a shipment and pay themselves for it just to keep the relationship.”

The General Manager of Supplier B had a similar view:

“...when they call me I trust them. I depend on the information they give and I trust it. We have a good relationship with (Company B) in Jordan and because of this we trust each other.”

Company B recognised the importance of mutual understanding in building long-term relationships with its suppliers. Moreover, difficulty of communication appeared to be a clear issue in the relationship the company had with its suppliers.

Supplier Information Integration

- **Operational Information**

Company B shared a range of operational information with its suppliers through email, phone and during suppliers visits. Examples of operational information included delivery information, production status, packaging information, order details, technical issues, sample information, quality inspection and stock levels. Documents B-49, B-51, B-61, B-62 and B-63 showed shipping details and order details that were shared between Company B and its suppliers.

The Business Development Manager, Operations Manager and Administration Manager explained that the operational information shared with suppliers was accurate and that little inaccuracy might happen due to human error. However, a lack of confidence in the

information given by suppliers existed. The Logistics Manager explained that the delivery information could be sometimes inaccurate due to suppliers' self-interest:

"... I have to revise the information received because suppliers sometimes work only for their own benefits. For example, they might give the estimated time of arrival (ETA) for a shipment to the port of Aqaba but they never tell if it is direct or indirect... this is because they know if it is indirect there is a possibility to be delayed so we then push them to send it in an earlier ship."

There was no regular sharing of operational information between Company B and its suppliers. Most operational information was shared when requested and there was no real-time access to information in the relationship. The operational information shared seemed to be of good quality and was double checked by recipients based on their experiences.

- **Strategic Information**

The transfer of strategic information such as future orders happened during the suppliers' visits to the Middle East every six months. The Merchandising Manager explained:

"We do not get the opportunity to meet with them (suppliers) very often unless they come to visit this part of the world. We share with them forecasting information which we get from our customers...this helps them prepare their capacity. However, some of them make their investments based on their own decisions."

The Logistics Manager stressed that strategic information received from suppliers needs to be double checked before decisions are taken:

"We need to ask first. For example there is a supplier who was about to shut down its production facility and we knew about that because of our follow up and asking other companies".

As the company followed guidelines from its customers, most of the strategic information exchanged with suppliers was decided by their customers. The model of nominated suppliers affected the quantity and frequency of strategic information shared between Company B and its suppliers. Therefore, there was little strategic information transferred between the company and its suppliers.

The company shared both operational and strategic information with its major suppliers. However, strategic information seemed to be relatively limited due to the direct contact between Company B nominated suppliers and customers through which much of strategic information was transferred. Operational information was then left to be

exchanged between the nominated suppliers and the focal company as and when required.

Supplier Material Integration

- **Standardised Procedures**

There were no highly standardised material flow procedures between Company B and its suppliers. The Merchandising Manager explained in Document B-47 that there were no identified procedures of shipping materials between Company B and its suppliers. Material shipping procedures were only identified in purchase orders (Documents B-47 and B-49).

The company did not have any initiatives for the management of material flow with its suppliers. Understanding of material integration with suppliers was limited to arranging the shipping of consignments through the arranged forwarder. Business Development Manager stated:

“They (suppliers) prepare the shipments through the forwarder and the communication is always through emails. The forwarder contacts us through also emails. The forwarder contacts the logistics department and accordingly the shipment is despatched.”

There appeared to be no clear standardisation of procedures of the management of material flow between Company B and its suppliers.

- **Close Coordination**

The Operations Manager explained that the coordination between the company and its suppliers in managing materials flow is limited to discussing the basic shipping issues:

“Their (suppliers) lead time for shipping is 30 days and for us the manufacturing lead time is 45 days for producing garments. This is the kind of discussion we have with suppliers. We discuss when they are going to start production, when they are going to ship it, when they are going to handover to the forwarder and the delivery information.”

Both Company B and Supplier B recognised the importance of collaboration in terms of facilitating the shipping process. Shipping was arranged between the company and its suppliers based on predefined shipping terms. Company B arranged the shipping forwarder used for the materials transference with suppliers. However, suggestions might be introduced by some suppliers in terms of nominating a different carrier company.

Company B did not seem to have a close coordination of material flow with its suppliers. There were no dedicated resources for managing material flow between the company and its suppliers.

Supplier Technological Integration

- **Information Sharing Systems**

All the respondents from Company B and Supplier B explained that Company B did not have any information sharing systems with its suppliers. For instance, the Merchandising Manager explained that the company did not have access to their suppliers' stock levels and they had to communicate when necessary:

"...it (access to information) is only on the need basis. If we need we ask them (suppliers) if they have a particular item in stock and they reply but there is no access all the time."

The Administration Manager believed that the small volume of their purchases affected having an information sharing system investment in place with suppliers. Moreover, this is due to the large number of suppliers the company had:

"...there is no access because we are dealing with big mill suppliers who are impossible to give us access to their systems... it is not easy with suppliers. You are dealing with a large number of them. We cannot force them to use our system; we are not big enough. They are willing to help but we are not big enough so it depends on how much we are buying from them."

This later view was also supported by the Business Development Manager. The General Manager of Supplier B believed that there is no need for information sharing systems to exist for the benefit of this relationship:

"... We do not do it because emails can handle our business. The information transferred is not big enough. I know what you are talking about. We have other information sharing methods with other companies but not with Company B."

The company did not have a connection with suppliers through any type of information sharing systems. Most of the respondents believed that there is no need for such investment with suppliers as long as business transactions are performed smoothly through online communication tools.

- **Communication Tools**

The company technological connection with its suppliers was limited to communication tools including email, phone and conference calls. The respondents agreed that email was an appropriate medium for communicating with suppliers. Documents B-49, B-51,

B-61 and B-62 showed purchase orders and shipping documents which were transferred through email. The General Manager of Supplier B explained that:

“Most of information is transferred by emails... emails are handling the information we need... the email is more than enough now.”

Information sharing through email and phone allowed Company B to maintain regular contact with its suppliers. This seemed to be affected by the type of the relationship the company has with suppliers which is limited to performing day-to-day business transactions. The suppliers needed to fulfil the company needs according to the customer instructions.

External Customer Integration

Customer Actors Integration

- **Long-term Relationship**

Daily and weekly meetings were conducted between the company and its customers who operated offices in Jordan. The company also conducted monthly visits for follow up business. Most formal were the meetings that were conducted at the beginning of each season every six months for discussing future orders. The Merchandising Manager explained that:

“There are customers who have offices in Jordan and visit us regularly. We have customers who have offices in the US and they visit us in Jordan. Also we have a US-based office which makes visits to our customers.”

No concerns were expressed by respondents about difficulties in building relationships with customers because of language differences. All respondents from both entities considered that there is a good level of communication in the relationship.

Company B and its customers appreciated the importance of conducting periodical meetings for managing their relationship. The company seemed to have a strong relationship and a mutual understanding with its customers who have been dealing with the company for many years. There appeared to be an understanding as to the importance of commitment in the relationship Company B had with its customers. The Business Development Manager explained:

“...in some cases a customer might need an urgent shipment and asks us to ship the garments by air. In such cases we share the costs. We show a good way in dealing with customers. We might sacrifice for them.”

The LOGIC Manager explained that there were sacrifices from both parties in the relationship:

“Yes sometimes it happens (sacrifices). For example, they push us to finish an order earlier than what agreed on and then we strive to finish it on the desired date for them if it was a big customer. On the other side, sometimes we might face problems that make us not to ship on time. So we ask for an extension and they cooperate on this issue though there are supposed to be fines and penalties on delay”.

The Purchasing Representative of Customer B explained the importance of keeping a healthy relationship based on commitment with Company B:

“Sometimes the vendors such as (Company B) face problems and we try to help them out as much as possible. For example, we ask them to give a delivery for an order and then they say that there will be delays for one or two weeks for production facility problems. So we try as much as possible to help them to find some ways that they do not pay the extra charges of shipping via air for this lateness. We sometimes provide them with initial information about anticipated quantities so that they can plan their capacity. Sometimes they would need to fill their production lines so we give them some orders or sometimes they produce extra garments so that we try to take that. I mean they know and understand how much we do to keep this relationship healthy and to keep them going for the benefit of both parties.”

There were two types of dedicated resources in the relationship between the company and its customers. First is a technological investment in terms of an integrated EDI system between the company and its customers. Second is a human investment in terms of dedicating offices for customers’ quality specialists at Company B production facilities as well as offering dedicated customer services for customers. Moreover, Customer B had an office in Jordan for closer communication with vendors of which Company B.

There appeared to be a willingness to maintain the relationship between Company B and its customers. The technological and human investments existed in the relationship supported the view of respondents about the continuity of the relationship.

- **Mutual Understanding**

The relationship Company B had with its customers seemed to be based on a mutual understanding. The Merchandising Manager explained:

“We are totally transparent; when a problem arises we report it to them. The same thing happens from their side; if they have forecasting and are not fulfilling their forecast they come to us and say they will not fulfil their commitment.”

The Purchasing Representative and General Manager of Customer B recognised the importance of mutual understanding in the relationship they had with Company B. The Purchasing Representative explained:

"... A good relationship is healthy for both of us (Customer B and Company B). For us having a reliable vendor is an advantage; we can ensure having our quality and delivery on time and ensure they are following our procedures correctly."

Several quotations by the respondents supported the importance and existence of trust in the relationship. The Purchasing Representative and General Manager of Customer B confirmed the importance of mutual understanding in the relationship they have with Company B. The Business Development Manager stated:

"They (customers) trust us. They give full trust... they are my customers and I have to trust them. They are giving us orders, so I show trust to them."

The Logistics Manager explained:

"There is mutual understanding between us (Company B) and them (customers). We usually consider the customer always right; and honestly it never happened that a customer did make a lie at us though it could happen that the supplier would lie at us."

The Merchandising Manager explained his view:

"We are totally transparent; when a problem arises we report it to them. And the same thing happens from their side; if they have forecasting and are not fulfilling their forecast they come to us and say they will not fulfil their commitment".

Mutual understanding seemed to be an important factor in Company B's relationship with its customers. The importance of mutual understanding to business continuity is realised by the company respondents as well as its customer company respondents. From the respondents' interviews as well as the observations during site visits, it appeared that the relationship between the company and its customers is built on mutual understanding.

6.2.3.2 Customer Information Integration

- **Operational Information**

The following excerpt from the Logistics Manager interview explained that Company B recognised the need for sharing operational information with customers:

"This is the most important thing (information sharing). If we do not share information we cannot meet the customers' needs. I need to know everything so that we can serve

them. For example, if I have no idea about the shipping mode and the date then I cannot do it so I need to know about this information very well.”

Operational information was shared between the company and its customers on a daily basis through emails, the EDI system and phone. Moreover, the observation in Company B suggested that two of the customers who had sourcing offices in Jordan such as Customer B shared operational information during weekly site visits to Company B. The Logistics Manager clarified that the operational information was shared regularly with customers:

“We always supply them with production status such as production schedules, reports, labour increase or shortage. For example, we updated them last week that we could not ship on time because of the snow storm of last week in Jordan.”

The Merchandising Manager supported the view of the Logistics Manager:

“We share full details with our customers. We share information like when we receive an order at what stage we are, if we are releasing the materials orders, if the materials are in house, if the production has started, when the delivery is, what the vessels are, what the schedules for this delivery are... we receive order information, technical information, colour approval information, sampling approval information, material approval information... we receive logistics information from them.”

The respondents confirmed the accuracy and trustworthy of operational information received from customers. A typical explanation was provided by the LOGIC Manager:

“They do not upload any information on their website unless they are sure about it. When we withdraw any information from their website they give confirmation on it. This confirmation is either through their website or emails. There are always discussions going on.”

There appeared to be an understanding as to the importance of sharing operational information in the relationship. The close relationship between the company and its customers seemed to have an impact on the significance of shared operational information.

- **Strategic Information**

The strategic information shared between Company B and its customers included forecasting, future business, capacity planning and production machinery or human investments. It was mainly shared through joint meetings between senior management every six months. The sharing of strategic information happened at the early stages of order development and during the order fulfilment if an order has been amended. The Merchandising Manager explained that there is significant information sharing between the company and its customers:

“We share full details with our customers... for strategic information; we share it if we are increasing capacity for them, if we are investing in new machines or manpower, if we are doing overtime. Everything; we share all information with them... we receive raw materials nomination, we receive forecast from them”.

The Purchasing Representative of Customer B explained the importance of sharing strategic information at the early stages of the order development:

“It is important for them (Company B) to have view of our forecast. They have to arrange their lines which they are operated by people. So they need to know how many people must have in the production facility as this is something cannot be arranged within one or two weeks. So they have to have in advance view”.

He elaborated and explained that sharing strategic information happens at different stages:

“The work in the garment industry comes at stages. You can have a forecast plus minus 20% based on which you can book a greige fabric. You do not have the colours or sizes or exact quantity yet but you can book a greige with the mill in China. And then after that when you have more information about the colours you can dye the fabrics into the colours you want. If you have more information about the Stock Keeping Units (SKUs) you would know how much exactly fabric you need so you can revise your fabric order with the mill. So we have a lot of ways to get as much information as possible and build as much as of planning based on this information.”

The strategic information shared between the company and its customers seemed to be of a high quality. The Merchandising Manager, Operations Manager, Business Development Manager considered that the information exchanged was trustworthy, accurate and meaningful.

There was a clear understanding as to the importance of sharing strategic information between Company B and its customers. However, much of strategic information was only shared after placing an order. Prior to order placement, sharing of strategic information would be limited to quantity projections at a general level. The purpose of sharing strategic information was mainly to plan the time scale and production capacity.

6.2.3.3 Customer Material Integration

- **Standardised Procedures**

Company B adopted a make-to-order strategy for supplying garments into international markets. The forecasting was received from customers initially at a general level every six months. Document B-54 showed that customers placed their orders based on a certain demand. The Purchasing Representative of Customer B explained how inventory was managed with Company B:

“The work in the garment industry comes at stages. You can have a forecast plus minus 20% based on which you can book a greige fabric. You do not have the colours or sizes or exact quantity yet but you can book a greige with the mill in China. And then after that when you have more information about the colours you can dye the fabrics into the colours you want. If you have more information about the SKUs you would know how much exactly fabric you need so you can revise your fabric order with the mill. So we have a lot of ways to get as much information as possible and make our planning based on this information”.

The shipping of goods between the company and its customers followed standardised procedures from the customers (Documents B-47 and B-50). Freight forwarders were nominated by customers for shipping materials from Company B. There was no direct access to material details and information was transferred through email, phone and EDI systems to the company production facilities.

Company B appeared to have standardised procedures for material flow with its customers. These procedures are largely decided by customers.

- **Close Coordination**

Company B closely managed material flow with its customers. This was mainly facilitated through dedicated customer service, major customers’ sourcing offices who visited the company regularly, and the Company B sourcing office in the USA. The Logistics Manager of Company B explained that the close relationship that they had with their customers was useful to manage the material flow with them:

“From my experience as a Logistics Manager, it is the relationship that matters. For instance, if there is a delay you can sort out any problem with the customers instead of for example paying extra costs for shipping by airfreight.”

As the company followed a make-to-order production strategy for dealing with customer orders, cooperation in inventory management did not appear to have importance. Before officially placing an order, the company received initial forecasting information from its customers about the potential orders. Based on this information the company made the necessary communication with, and planned the raw materials sourcing from the nominated suppliers.

Company B appeared to have a close coordination of material flow with its customers. This was enhanced through the close relationships based on mutual understanding that the company appeared to have with its customers.

6.2.3.4 Customer Technological Integration

- **Information Sharing Systems**

Company B did not have any information sharing system for connecting with its customers. The only dedicated system that was used for information sharing with customers is an EDI system (Document B-54).

An excerpt from Document B-54 reads:

“We (Company B) use a web-based links to log into customers websites and exchange information and we have special software and printers by which specific data is received and printed; it is like a barcode sticker. These bar codes are received with the help of special software from customers’ websites and special printers for printing them.”

Document B-69 showed that Company B used a version of EDI connection known as XPC through which documents and data were interchanged with customers on a daily basis and at different stages of the order. Another EDI technology that was used at Company B is software known as TeamSite through which it was connected with two of its major US customers. The XPC and TeamSite applications are web-based and the investment of these applications was made through the customers.

The Logistics Manager explained that:

“They (customers) have a website that we can use for booking. For Example take (customer company name), when I need to print stickers I do it through their website. I enter the purchase order number and print stickers. Even I can print reports from their website.”

The Purchasing Representative Customer B added to this view:

“We have a website which they can provide information through it. For example, if we have a purchase order we send it through the website which of course they have it installed here in their system. When we send an order they receive it through the website, they can accept or reject the purchase order through the website, they can add comments through the website.”

When he was asked about whether it would be useful to invest in information sharing system, his response was:

“I do not think so. Any time we ask for information they provide us with it. So there is no need to have direct access to their information... actually it is not necessary because we have the emails which they are pretty enough. Also, we have visits every now and then. I visit the production facility and I can have fresh conversation and talk to the people. With the email and the website we do not need to invest in any other technology.”

The only dedicated information sharing system between Company B and its customers was an integrated EDI and a web-based EDI.

- **Communication Tools**

The communication tools that were used for information sharing between the Company B and its customers included emails, phone and conference calls with the emails being the most convenient too. The following extract is by the Business Development Manager of Company B who commented on a question related to the technologies used for connecting with their customers:

“Some of our customers started recently discussing a new technology which is making the communication during the development stage through instant messaging such as Skype. Other customers are asking us to use Skype and other tools such as video conferencing. The other group of customers is sharing their information through communication only. And that’s it. The only technology they are using is a template for their technical packages”.

Interviewees from both Company B and Customer B believed that communication tools are essential to perform the business operations smoothly. In addition, to the integrated EDI and web-based EDI, Company B used emails as the main medium for information sharing with its customers.

5.2.5 Case Summary

Table 5.2 shown below provides a summary of how Company B integrated internally amongst the production and supporting functions and externally with its suppliers and customers.

		Actors	Information	Material	Technological
Supply Chain Integration - Case B	Internal Company Integration	Informal daily meetings, no periodical meetings, arranged meetings, pre-production meetings, joint-planning, shared goals.	Full access to operational information and regular sharing of strategic information, real-time access to operational information, high quality information.	Close coordination, identified procedures, real-time access to stock levels and WIP.	ERP system, shared folder through the server, communication tools: email and phone.
	External Supplier Integration	Infrequent meetings, infrequent contact, no dedicated resources, problem solving.	Infrequent sharing of operational and strategic information, no real-time access, high quality information.	Partially identified procedures, no dedicated resources, no inventory initiatives.	Communication tools: email, phone and conference calls.
	External Customer Integration	Periodical meetings, dedicated customer service, quality reps based on-site, technological investment, customers sourcing offices, mutual understanding.	Regular sharing of operational and strategic information, no real-time access, high quality information.	Identified procedures, close coordination, nominated forwarders, and no inventory management initiatives.	Integrated EDI, web-based EDI, communication tools: email, phone, conference calls, fax.

Table 5.2: A summary of integration across Supply Chain B

The way Company B integrated with its customers was different from the way it integrated with suppliers. The customer integration was characterised by a close relationship based on a mutual understanding, sharing regular information, close and standardised material flow, and technological integration. However, supplier integration was limited to performing the day-to-day transactions. The internal company integration was characterised by full access to information on a real-time basis, close material flow coordination and technological integration.

5.3 Case Study C

This case study consists of a garment manufacturer in Jordan, being the focal company, a supplier in Turkey and two customers in Dubai and Qatar. The supply chain for Case Study C is shown in Figure 5.7 below.

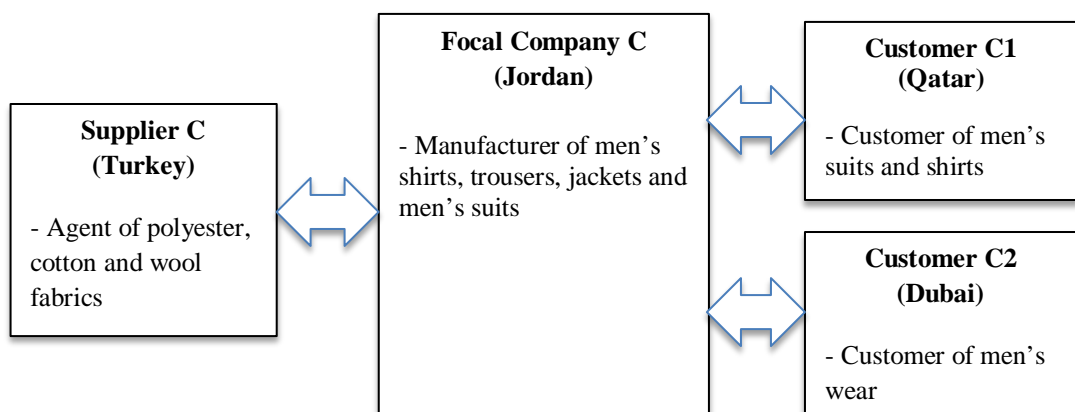


Figure 5.7: An overview of participating companies in Case Study C

5.3.1 Company C

Company C is a manufacturer of men's shirts, trousers and suits located in Jordan with over 320 employees working at the company two locations in the Jordanian capital, Amman. The company has been involved in the garment manufacturing business since 1949 and is a publically held company. It started to be involved in exporting activities in 1962. Its vision was identified as to become a leading manufacturer of men's clothing in both the regional and global markets. The company is committed to its brand quality through using the finest fabric in its garments.

Organisational Structure

Company C has a Board of Directors who are not involved in the company business operations and based outside the company. The General Manager is responsible for dealing with activities at the strategic level and is usually not involved in the daily business operations. The different business functions report directly to the General Manager. A simplified organisational chart for Company C is shown in Figure 5.8 below.

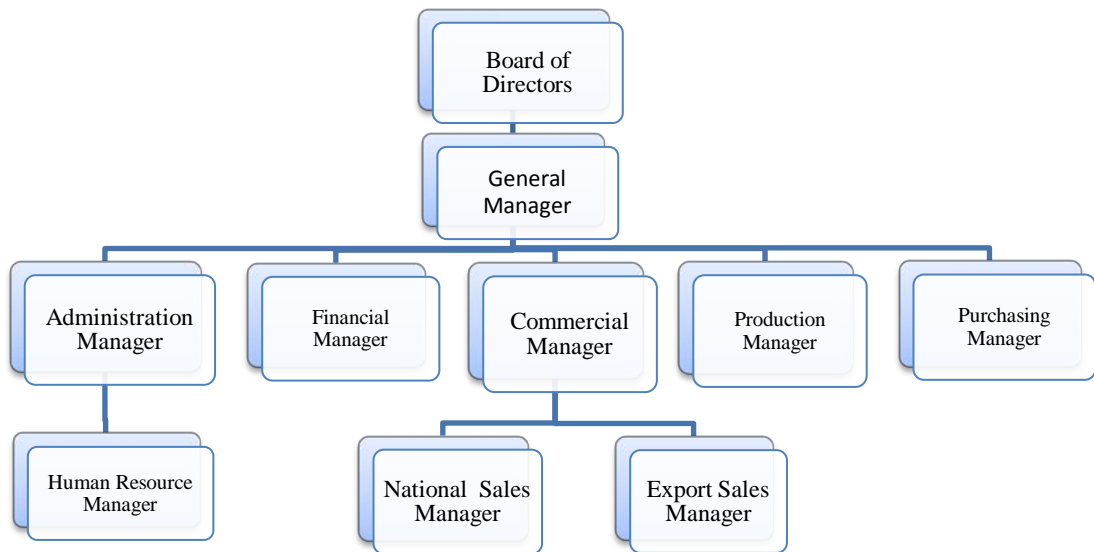


Figure 5.8: The organisational structure for Company C

5.3.2 Suppliers

Company C major fabric and trim suppliers are located in China, Thailand and Turkey. The suppliers of secondary materials such as poly bags, hangers and cartons are all located in Jordan. One major fabric and trim supplier was involved in this case study and is referred to hereafter as Supplier C. An overview of Supplier C and its business with Company C is introduced below.

- **Supplier C**

Supplier C is a service company who has been involved in exporting Turkish garments, textiles and accessories to the Middle Eastern markets since it was established in 1994. The company is an agent of polyester, cotton and wool fabric suppliers located in Istanbul, Turkey with approximately 100 employees. Supplier C works as an intermediary between Company C and the relevant fabric and trim producers in Turkey. The relationship between Supplier C and Company C goes back to 2007 when Supplier

C searched for appropriate cotton fabric producers for Company C and then arranged the export procedures and shipping to Jordan.

5.3.3 Customers

Company C sells its products to both national and international markets. The national market is served through several distributions channels wholesale, retail shops and customised orders through a make-to-order strategy. The national markets make around 60% of the total company sales and the rest is supplied to international customers. The company started serving international markets in 1962 and is currently exporting to several countries in the Middle East and USA with Dubai, Qatar and Palestine being the most prominent markets making around 70% of its total export sales in 2011.

Company C serves international customers based on both make-to-stock (MTS) and make-to-order (MTO) strategies. The MTS products are dispatched from the range of the company branded labels which are stocked as finished garments and supplied to customers after an order has been placed. The MTO products are supplied after the company pulls demand from customers and uses the stocked fabrics in their warehouses to produce the requested orders. Some customers might ask for other colours or types of fabrics. Two major international customers, Customer C1 and Customer C2, were involved in this case study as detailed below.

- **Customer C1**

Customer C1 is a small-sized retailer of men's wear located in Qatar with 7 employees. The company was formed in 2003 and sells its products through two local retail shops as well as contract sales of uniforms to several hospitals, hotels and restaurants in the country. It has a General Manager, an Indoor Sales Manager who is responsible for the two retail shops and an Outdoor Sales Manager who is responsible for the contract sales.

Customer C1 has been dealing with Company C since 2008. Customer C1 sources ready-to-wear men's shirts from Company C and sells them through the retail shops. It also sources from Company C work wear uniforms based on full-package manufacturing and supply. The General Manager of Customer C1 makes seasonal visits every six months to Company C's production facility to choose from the available fabrics before placing work wear's orders.

- **Customer C2**

Customer C2 is a family-owned small-sized retailer of men's wear based in Dubai with 12 employees. The Company was established in 1976 and has two retail shops in Dubai and one in Beirut, Lebanon. For each shop there is a manager and two-three employees. The General Manager and the Owner shares responsibilities of office administration and making sourcing arrangements with suppliers.

Customer C2 has been dealing with Company C since 1983. Company C supplies Customer C2 with men's shirts, trousers and suits. The General Manager of Customer C2 makes seasonal visits every four-six months to Company C's production facility to choose from the available fabric before placing suits and trousers orders. Customer C2 also sources Company C's branded shirt every year.

5.3.4 Case-by-case Analysis: Case Study C

Data collected for this case study involved evidence from several sources across the supply chain. From the focal company, Company C, seven major face-to-face interviews were conducted with the Purchasing Manager, Purchasing Coordinator, Export Manager, National Sales Manager, Logistics Manager, Quality Manager and Production Manager. Two follow up interviews were conducted with the Export Manager and Production Manager. Direct observations were made during four sites visits to the production facility and head office and twenty seven internal company documents were collected. From the buy side, one telephone interview was conducted with the Sales Manager of Supplier C. From the sell side, two major customers, Customer C1 and Customer C2, were involved in this case study. One telephone interview was conducted with the General Manager of Customer C1 and one telephone interview was conducted with the General Manager of Customer C2. Figure 5.9 below summarises the respondents and number of interviews conducted across Supply Chain C. Company C is a full-package manufacturer who sources fabrics from suppliers, such as Supplier C, anticipating future demand from customers, such as Customer C1 and Customer C2.

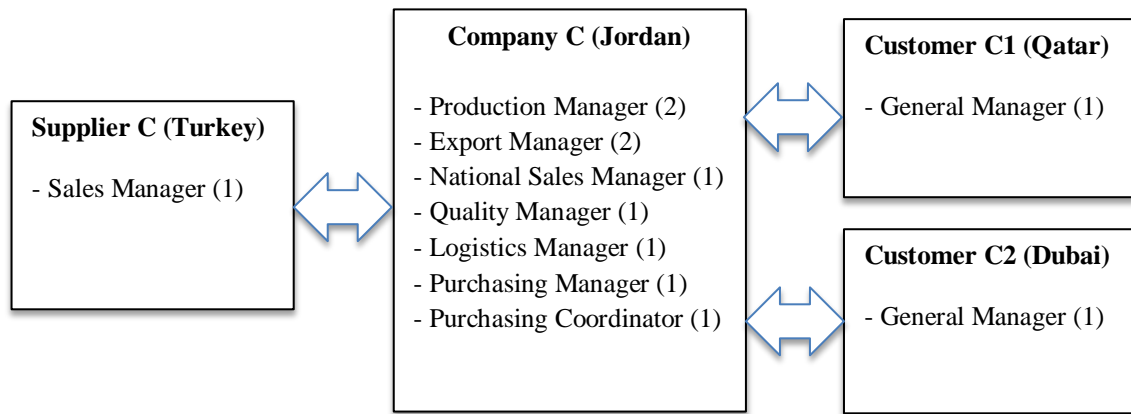


Figure 5.9: An overview of the respondents and number of interviews across Supply Chain C

Internal Company Integration

Internal Actors' Integration

- **Cross-functional Teams**

The company conducted a weekly problem solving meeting for the production and supporting functions. The Production Manager explained the context of this weekly meeting:

“There are agendas for each meeting. One of the agendas for example in today's meeting is to discuss the 2013 plan in terms of purchasing and production needs and the orders and forecast we have. We have conducted several meetings to discuss these issues and today we are hoping to reach final solutions. And also we discuss what is going on and the problems in production and so on... everyone needs to give his opinions about the problems we are facing. Our meetings involve brainstorming.”

The National Sales Manager explained that the purpose of the weekly meeting is to solve any problems arising. She explained that the weekly meeting is:

“For developing the businesses, and solve any problems in the company. Also if anyone has any comments about other departments they discuss them in this meeting. Sometimes when we need to develop a new product we take the opinion of the other departments... we had a meeting in the beginning of this year in which everyone talked about his/her business plan. This is because we are connected together. The production department needs to know very well about the sales department so that they can make sure they are ready for the next stage. So the process is integrated between all the departments.”

Document C-6 showed a supplier report which was developed during the weekly meetings. Documents C-2, C-3, C-4 and C-5 showed the weekly meeting agendas and minutes of meetings. These contained the participants' names, their role and detailed description of the discussion and results of such meetings. These meetings were

arranged and chaired by the Quality Manager who played the role of organiser for the periodical meetings in the company. An excerpt from the minutes of meetings in Document C-3 reads:

“The Production Manager confirmed that there is a clear shortage of production orders which resulted in lower productivity. He asked the commercial department to get more production orders. He clarified that the orders he currently has keeps the production capacity underutilised...”

Company C conducted weekly periodical meetings amongst the different functions. These appeared to be cross-functional meetings based on which the company problems were discussed.

- **Joint Planning and Shared Goals**

Several quotations which explain the context of joint-planning between the production and supporting functions were extracted from the interviews within Company C. The Quality Manager explained that:

“This year specifically, we set an annual plan for the whole company and for each department there are goals. Later these goals will be achieved based on an action plan.”

The Logistics Manager stated that:

“Every department has set its annual plan and set goals which were discussed at the beginning of the year. These goals were discussed and combined together and become the company goals. Even the head of departments discussed the other head of departments’ goals.”

The Production Manager explained that:

“Every head of department develops ideas for his department. One of the goals for 2013 is to make developments in the production facility. There are general goals for the company and there are narrower goals for the departments.... These goals have a timescale.”

Document C-1 showed reconstruction of the quality system project which was developed by the Quality Manager after recommendations from the General Manager. Although the project report was developed only by the Quality Manager, Documents C-5 minutes of meetings showed that the report was discussed in a dedicated departmental meeting. This supported the view that there was joint planning amongst the production and supporting functions.

There seemed to be an understanding of the close coordination and interdependence between the production functions in Company C. The respondents explained that in

most cases the production departments needed to consult each other when decisions were taken. Moreover, Company C appeared to have joint establishment of goals with the different departments.

Internal Information Integration

- **Operational Information**

Company C shared operational information such as stock levels, order details, purchase orders and delivery details amongst the production departments on a daily basis. The company benefited from the duplicated role of Quality Manager as a coordinator amongst the production and supporting functions for transferring information. The Quality Manager explained:

“We have procedures through which information is distributed. If there is a sales order it arrives to me through the commercial department and then I distribute to the production department.”

Documents C-2, C-3, C-4 and C-5 showed that there was significant sharing of operational information amongst the production and supporting functions during the weekly meetings. These documents included discussion of the day-to-day business between the production and supporting functions.

The National Sales Manager provided an example of how she ensures the accuracy and timeliness of operational information:

“For example, if I access the system and need to check the available stock of white fabrics for shirts, then I double check with the warehouse to make sure it is the right quantity as it might have not been updated on the system.”

There seemed to be regular sharing of meaningful operational information amongst the production functions in Company C. Operational information was shared through daily meetings, the internal information system and email communication.

- **Strategic Information**

Strategic information was shared amongst the different functions during the weekly and annual meeting. The Logistics Manager explained that:

“Every department has set its annual plan and goals which were discussed at the beginning of the year. These goals were discussed and combined together and have become the company goals. Moreover, the head of departments discussed the other head of departments’ goals.”

Documents C-2, C-3, C-4 and C-5 showed that strategic information was shared amongst the production and supporting functions during the weekly meetings. This information was distributed to the departments heads based on cross-functional teams discussions. For instance, an excerpt from Document C-5's minutes of meetings reads:

“Developing a timescale for the design department plan for the year 2013; make annual advertising subscriptions with specialised fashion magazines; every department has to develop a main goal and work to achieve during next year; the Logistics Manager presented his department plan for year 2013...”

Company C seemed to share significant strategic information amongst the different functions on a weekly and annual basis. This information appeared to be meaningful and documented for the purpose of ensuring its effectiveness.

Internal Material Integration

- **Standardised Procedures**

Company C seemed to be affected by the sourcing and supply strategies which were identified in the previous chapter. These included stocking of fabric and trim and stocking finished garments of its shirt brand in anticipation of customer demand. The Logistics Manager explained that the raw material needed was sourced for the whole year and stocked in anticipation of future demand:

“Based on what we need to sell annually, we plan annually what we need to produce. After that the plan is sent to the production department which decides how much we can produce (capacity). Based on this the warehouse department would then report what is available of the needed materials in the warehouse. So this is a plan for a year because we know who our customers are. So usually we do not accrue high holding costs.”

The Logistics Manager, Quality Manager and Production Manager also explained that the company had identified procedures for managing internal material as it arrives, such as when to call material from the warehouse, how much work-in-progress to keep per production line and the customer order despatch procedures. However, the company suffered from out-of-stock levels and excess inventory at the end of season. The Purchasing Coordinator explained his understanding of how it worked based on a make-to-stock strategy:

“When you purchase materials for a year you need to add to it shipping costs and demurrages. If you need to import it every year it is going to cost you a lot.”

Although the company had relatively highly standardised procedures for the management of material flow amongst the production and supporting functions, there appeared to have problems with stock control strategy as explained in the next point.

- **Close Coordination**

Company C did not appear to have effective close coordination of internal material flow. The observational evidence suggested that the company suffered from inefficient stock control. Documents C-12, C-17 and C-18 are photos of obsolete fabrics that were taken during a site visit to the production facility. These were seen as self-explanatory of the inefficiency of material management in Company C. The National Sales Manager explained her view:

“Honestly we have too much stock. We have too much obsolete and out-of-fashion fabric stock so we are trying to get rid of it. Sometimes we make pyjamas or robes out of the obsolete fabric. So we are trying to get rid of this stock by making other styles out of it.”

An excerpt from Document C-3 reads:

“The Production Manager confirmed that there is a clear shortage of production orders which resulted in lower productivity. He asked the commercial department to work on getting more production orders. He clarified that the orders he currently has keeps the production capacity underutilised...”

The previous quote explained that there was a communication gap between the production and merchandising functions in working based on a make-to-stock strategy. Company C seemed to suffer from the high levels of fabric held in stock and finished garment at the end of season. There did not seem to be a smoothed material flow within the company.

Internal Technological Integration

- **Information Sharing Systems**

The company had an internal information sharing system known as Al-Shomaly. The Purchasing Coordinator clarified the internal technological connection through this system:

“There is internal software which all departments in the company work based on. Any information that might be related to the items or products is available on this system, known as Al-Shomaly. Anything pertains to the company is available on this system.”

The Production Manager explained there is a range of information that can be accessed through Al-Shomaly:

“We have a system called Al-Shomaly which is related to the information internally such as orders, import, export, company stocks, warehouse stocks, and the orders that

we receive from customers are all saved on this system... it is accessible by finance, production and purchasing as well as commercial departments. We are now working further on developing this system through which the commercial department can see the stock levels and operational information as well as finance information.”

Company C internal production functions were technologically connected through a simplistic ERP system.

- **Communication Tools**

The different company functions were connected through phone and email communication. The Quality and Export Manager explained that email was extensively used for sharing both operational and strategic information. The observation in Company C suggested that no other communication tools were used for information sharing within the company.

External Supplier Integration

Supplier Actors Integration

- **Long-term Relationships**

Document C-6 showed an example of a supplier assessment report based on which Company C determined the level of the relationships with its suppliers. The National Sales Manager, Export Manager, Logistics Manager and Purchasing Manager explained that there were seasonal visits every six months to a year which were usually made by the company senior management to their suppliers in order to keep up to date with the future business. The Purchasing Manager explained that the company exchanged periodical visits with the major suppliers and that:

“These visits are to stay in touch and follow up any possible problems. And this is to expand the knowledge base between us. We exchange information which benefits us in assessing our suppliers. We exchange information which allows us to understand the other country business environment and situation. The suppliers whom we have a good relationship with we trust them and they trust us.”

The Sales Manager of Supplier C explained:

“We are in contact with them (Company C) but not on a daily basis...They (Company C) usually visit us at the beginning of each season usually every 3-6 months... we do not visit them but they visit us.”

Although Company C had long relationships with its suppliers, there was little evidence of the development of these relationships over time. It did not seem that these relationships have been developed to a strategic or partnership level. Seasonal visits

were usually made by the company senior management to their suppliers in order to keep up to date with future business.

Based on the long history of the relationship that existed between Company C and its suppliers, there was a belief that this relationship would continue. The premise was that Company C had identified its major suppliers based on the assessment of the relationship over a period of time. Therefore, there seemed to be commitment by the company to use these suppliers as long as the quality, price and service are at the expected level. When the Quality Manager was asked about the future of the relationship with suppliers and whether it is expected to continue, his view was that:

“Yes for the major suppliers. Despite the high prices they give but we are committed to work with them due to the accuracy in delivery and commitment in timing.”

However, the company did not have any dedicated resources for managing the relationship with its suppliers. Although the relationship has a long history, the company and its suppliers appeared not to be interested in building closer and committed relationships.

- **Mutual Understanding**

Company C seemed to have communication difficulties with its Chinese suppliers because of the language difference. The Purchasing Coordinator explained his view:

“There is no problem with culture and business environment but probably language with the Chinese and Indians. There is nothing more than that.”

The company arranged translators to overcome the problem of communication difficulties with its suppliers. The National Sales Manager explained that:

“There are usually translators. Especially when we go to China there is a translator. And when we go to Turkey there is a translator.”

This view was confirmed by the Quality Manager who explained that:

“Yes sometimes it (communication difficulty) happens. There is because of the problem of language and culture. However, you know now foreign companies employ people who understand your language or can communicate with you or assign a translator.”

The Purchasing Manager had a different view in that the clothing business language is understood by the trading companies. He explained:

“We use the business language of garment industry. We communicate using garment industry standard terms and language.”

However, this does not greatly contradict with the above views in that the Purchasing Manager considered the language difference did not exist when speaking business language.

A trustful relationship was developed between Company C and its major suppliers. The Purchasing Coordinator explained that mutual understanding was developed with their suppliers over time. However, the Quality Manager and Production Manager believed that mutual understanding and trust should be at higher levels when compared with the long history of relationships that the company had with its suppliers. The Sales Manager of Supplier C explained that:

“Business is about money but we also trust them (Company C) and we are happy with them... once we find the materials for them they open a Letter of Credit (LC) for us and they deposit the amount they have and after a month we take the money... sometimes we ask them for 30% of the payment and the remaining when they have cash available. So we receive the money after a month or so.”

The company and its participating supplier recognised the importance of mutual understanding in the relationship. Mutual trust and understanding were developed over the long relationship the company had with its major suppliers although this relationship did not appear to be strategic. The overall evaluation of mutual understanding was that it could be at higher levels although it satisfies the type of the relationship that existed.

Supplier Information Integration

- **Operational Information**

Company C did not have real-time access to operational information with its suppliers. It was transferred through phone and email only when needed between Company C and its suppliers. The Sales Manager of Supplier C explained:

“We are in contact with them (Company C) but not on a daily basis... we share with them prices, quantities, qualities, available products and appointment arrangements.”

Document C-7 showed an example of how operational information such as product details, delivery details and prices were exchanged with suppliers. The format of information transferred did not seem to be easy to understand. However, there was no evidence on the quality of operational information transferred by suppliers. Company C respondents did not raise any concerns regarding the quality of operational information received.

There seemed to be little operational information shared between Company C and its suppliers. Operational information such as delivery schedules, updates and order details was shared by suppliers after an order has been placed. It is transferred through phone and email when needed between Company C and its suppliers and there was no real-time access to operational information.

- **Strategic Information**

There did not seem to be significant sharing of strategic information between Company C and its suppliers. For instance, the company did not officially share forecasting information with its suppliers. When the Purchasing Manager was asked about whether they transfer forecasting information to suppliers, he stated:

“We do forecasting of the global market. If I forecast that the prices of threads are cheaper than the next month then I buy it now. Our suppliers advise us if it is better for us to buy the materials now.”

This quote indicated that there is a lack of understanding of the importance of sharing forecasting information with suppliers for the benefit of the relationship. The Logistics Manager, Production Manager and Export Manager explained that there was no regular sharing of strategic information with suppliers. The Purchasing Coordinator and Purchasing Manager explained that there was a folder for each customer in which strategic information about major customers is kept.

Company C transferred strategic information regarding the fabrics needed to its suppliers three months in advance in order to give the agent time for findings materials and to arrange meetings with the relevant mills. The Sales Manager of Supplier C explained:

“They (Company C) would say that we will visit you after 3 months and they need fabrics of trousers and shirts for example. They would give us information in advance so that we start searching for them. If they need wool or cotton or polyester fabrics for example we search for these fabrics and we let them know and then they come and we arrange for them to visit the appropriate mills.”

Strategic information was shared when required and its importance did not seem to be understood in the relationship.

Supplier Material Integration

- **Standardised Procedures**

There were no inventory management initiatives or highly standardised procedures for the sourcing of material between Company C and its suppliers. However, there were relatively clear procedures about identifying the shipping terms. The Quality Manager explained that the procedures are limited to identifying shipping documents and details. The Purchasing Coordinator explained that the material flow coordination with suppliers is limited to arranging the shipping documents:

“They (suppliers) send us the packing list and Performa Invoice and we stamp them with the company stamp and we send these documents back to them and then they despatch the order to us.”

The Sales Manager of Supplier C also explained that Company C usually informs them about future visits so that they can search for the materials they need and identify the appropriate mills to produce the fabrics needed. He quoted:

“They would give us information in advance so that we start searching for them. If they need wool or cotton or polyester fabrics for example we search for these fabrics and we let them know and then they come and we arrange for them to visit the appropriate mills.”

Company C had limited standardised procedures with its suppliers. The company agreed with its suppliers on the way materials need to be shipped and sent them notifications of future visits. However, the Purchasing Manager was not able to make decisions about the material needed until he visited the arranged mills which did not lead to reduction in delivery lead time.

- **Close Coordination**

The transference of raw materials between Company C and its suppliers was performed based on coordination of finding the cheapest shipping charges. The Purchasing Manager explained:

“There are shipping companies whom I deal with. However, before making an order I need to double check the shipping charges. However, if the supplier has a better price with another shipping company we ask them to use it for shipping our materials.”

This view was supported by the Sales Manager of Supplier C who stated that:

“Company C gets a price from shipping companies in Jordan and they tell us about it so that we can see if the shipping company from our side is cheaper then we use it. It is usually cheaper from our side as we have frequent orders with these shipping companies.”

Apart from this, there did not seem to be coordination between the company and its suppliers in managing material flow. There was no real-time access to stock information or production plans between the company and its suppliers. Inventory at Company C was managed in isolation and without the intervention of the suppliers. Company C appeared to lack understanding of inventory management initiatives that could be achieved with suppliers.

Supplier Technological Integration

- **Information Sharing Systems**

There was no information sharing system connecting Company C with its suppliers. It was believed that having information sharing systems with external parties could threaten the privacy of information. The Purchasing Manager explained his view:

“We could use sharing folders but we do not want others to see our information. So the best medium for us is email. In this way you maintain the privacy of your information which you do not want to be shared with others.”

Company C did not have any dedicated technological investment with its suppliers. The notion of having a technological connection was not well understood by the company respondents.

- **Communication Tools**

The only mediums of communication between Company C and its suppliers were email and phone. Document C-7 is an example of how information was transferred through email. This document showed the operational information transferred between the company and its suppliers such as fabric details, shipping terms and details. The Sales Manager of Supplier C explained that:

“They (Company C) send us their requirements by email and we reply by email. For example, they send us product requirements and we reply to them by email that we will send you a sample of the product on a specific date.”

Email appeared to be the most frequently used medium of information sharing with suppliers. There did not seem to be any future plans for investments in information sharing systems.

External Customer Integration

Customer Actors Integration

- **Long-term Relationships**

There did not seem to be much confirmation on the closeness of the relationship between Company C and its customers. For example, there appeared to be no visits made by Company C to its customers. However, the customers made visits every season (3-6 months) in order to choose from the stocked fabrics and find out about the new designs in Company C. The Export Manager explained that:

“...when they (customers) visit us (Company C) in here we talk about future plans and potential orders. For example, we have already a plan for our customer in Ramallah for May which is 4 months from now.”

The General Manager of Customer C2 explained:

“The owner sometimes makes visits to Jordan so he takes advantage of being there and checks what fabrics they (Company C) have... He does not go to Jordan just to visit them. If he has a visit to Jordan for any other reason, he takes advantage of this and visits them. Sometimes we ask them (Company C) for the fabrics they have and they post us a sample and based on it we decide whether to order or not.”

The General Manager of Customer C1 and Customer C2 explained that the communication level that Company C has with its customers should be improved in order to make closer relationships. For instance, the General Manager of Customer C1 explained:

“There is a close contact with Company C but we have a problem of communication with them... they do not take advantage of the communication tools.”

The relationship between the company and its customers seemed to lack a good level of communication. There were no regular visits arranged by the company or its customers. It seemed that the relationship needs more mutual meetings, better communication and strategic planning.

There were no dedicated resources in the relationship that Company C had with its customers. However, sacrifices had occurred over the long history of the relationship.

The Export Manager explained:

“We always have sacrifices for them (customers). Sometimes we pay more for airfreight in order to meet their expected delivery times. We also give them extended credit terms and postpone payments times... Sometimes they put good efforts to let us plan our capacity as they provide us with their expected orders.”

Customer C1 and Customer C2 raised the issue of stock availability that might affect their future relationship with Company C. For instance, the General Manager of Customer C1 explained:

“We (Customer C1) have a contract with them (Company C) which we renew every two years. However, I told their senior management that if they do not supply me with the products I need then I will find them from other sources. And this happens because they do not stock all types of fabrics we need”.

The only evidence of commitment that might be considered between the company and its customers was the long business relationship. It seemed that the company brand name and its quality affected the continuity of business between the company and its customers over the years.

- **Mutual Understanding**

A trustful relationship has evolved over time as most of the company customers had been dealing with Company C for more than 20 years. The Export Manager and Quality Manager explained that there is high level of honesty with customers. The General Manager of Customer C1 explained his view:

“There is a mutual understanding with them (Company C). We have no problem with this and any mistakes are usually not on purpose. We trust them and they have confidence in our payments as well.”

This view was supported by the General Manager of Customer C2 who commented on mutual understanding with Company C and explained that:

“It is very good (mutual understanding). If it was not good we would not be working with them for long...sometimes minor things happen and it is not a big deal. It could be mistakes in production but it is not something that happens frequently... there is no problem.”

The relationship between Company C and its customers seemed to be built on mutual understanding. Although it appeared that the low level of communication affected the relationship between Company C and its customers, the company and its customers confirmed that there was trust and understanding in the relationship. Mutual understanding was evolved over time as most of the company's customers had dealt with Company C for long time.

Customer Information Integration

- **Operational Information**

There was no regular operational information sharing between the company and its customers. The General Manager of Customer C1 explained:

“That’s it there is no further communication usually. They give us the expected date for garments to be ready and I call them at the date they give us to double check if it is really ready... this information is usually accurate but if it is not then it is not on purpose because it happens in business.”

The Export Manager explained that operational information was shared after an order has been placed and would include:

“Delivery updates, payments, lead time updates, new products, container information, delivery schedules, potential delays, packaging specifications and details, shipping terms, shipping mode, dispatching and receiving details.”

There did not seem to be significant sharing of operational information between Company C and its customers. There was little operational information shared after an order has been placed.

- **Strategic Information**

There seemed to be a lack of understanding as to the importance of sharing strategic information with customers. The Quality Manager commented on the issue of collecting market information from customers:

“There should be a department in our company to do this. But there is no such department. I have already suggested having a specialised department that is concerned with gathering information from the market.”

Some of the company customers tended to transfer information about their future demand although this was not arranged in a formal way. As Company C worked based on a make-to-stock there was also strategic information about future garments designs transferred to customers. There was no evidence on how and what was the benefit of this information to the relationship. The General Manager of Customer C1 commented on the accuracy of strategic information shared by Company C:

“...It happened in the past that I agreed with my customers about particular products that I will deliver for them based on agreements with (Company C). However, they (Company C) said that the products are not ready or we could not find the fabrics we told you about.”

There was little strategic information shared between Company C and its customers. Therefore, this information sharing did not appear to be of clear benefits to the relationship.

Customer Material Integration

- **Standardised Procedures**

Company C stocked a range of fabrics in anticipation of the customers' demand. Some fabrics were sourced upon customers request if the lead time given by the customers allows for sourcing, manufacturing and delivery. The General Manager of Customer C1 explained:

“We have requirements for different customers and we need to meet these requirements. However, sometimes (Company C) does not have a particular type of fabric and they offer the service of sourcing this fabric for us. It takes them ages so we look for other manufacturers... And this happens because they do not stock all types of fabrics we need.”

Company C arranged carriers for delivery to its customers depending on the destination. The General Manager of Customer C2 explained:

“They (Company C) organise it (shipping). We have no business to do with this. We buy based on Cost, Insurance and Freight (CIF) terms so they take responsibility of shipping. So they cover the Cost, Insurance and Freight... They give us the total price and that's it.”

Similarly, the General Manager of Customer C1 explained:

“They give us the shipping charges included in the garment price... they have a carrier which they deal with... their carrier is really good and we have no problem with shipping issues with them. They are professional in this and so is their carrier.”

There did not appear to be close coordination of material flow between Company C and its customers. The company did not have inventory initiatives with any of its customers.

- **Close Coordination**

There was no access to material details between Company C and its customers. Material information such stock availability and delivery schedules was transferred by the Export Manager of Company C when requested by customers. The Production Manager explained:

“There is no access to materials updates or stock levels we send them the information they need when they request it... Usually I get contacted by the Export Manager who asks for order status and fabric available in the production facility and the warehouse and in turn she transfers this information to the customers”.

This was also confirmed by the Quality Manager, Logistics Manager and Export Manager who explained that coordination with customers is limited to transferring operational information when requested. When the General Manager of Customer C1 was asked about the coordination in material flow with Company C, he explained:

“That’s it there is no further coordination usually. They give us the expected date for garments to be ready and I call them at the date they give us to double check if the garments are ready.”

There did not seem to be much collaboration between the company and its customers for the transference of goods except for providing the shipping details.

Customer Technological Integration

- **Information Sharing Systems**

All the interviewees confirmed that Company C was not connected with any of its customers through information sharing system. The General Manager of Customer C2 explained that he is not aware of any other technologies than communication tools for connecting between companies. When he was asked about the technologies that connects his company with Company C, he stated:

“I know that there are phones and emails but I do not know any other types of communication. If you know more tools for communication let me know about it.”

It is worth mentioning that after explaining the possible technologies that might connect them with Company C, the General Manager of Customer C2 welcomed with the idea of using the other communication tools such as Viber and Skype. His view was that this might also be useful for customers to show Company C the sample before posting it.

There was no information sharing system between the company and its customers. Moreover, there was no understanding of other technological connections for information sharing across the supply chain.

- **Communication Tools**

Company C and its customers were connected through email and phone. The General Manager of Customer C1 commented on the way Company C connects with his company:

“The problem is that communication with them is limited to emails and phone. They do not take advantage of the available communication tools such as Skype and Viber. All companies now benefit from these tools as it makes things easier. We tried several times to push them to use such tools but they have not been responsive. Through Skype and

Viber it is easier to get hold of your manufacturer when you need any quick updates. Moreover, they are free and handy... I think there are better mediums of communication and they are free. It is not efficient that they phone me just to know whether we have received an email or not.”

Whereas email was used regularly, there appeared to be a lack of understanding as to the importance of other communication tools for information sharing with customers.

5.3.5 Case Summary

Table 5.3 shown below provides a summary of how Company C integrated internally amongst the departments and externally with its suppliers and customers.

		Actors	Information	Material	Technological
Supply Chain Integration - Case C	Internal Company Integration	Periodical weekly and annual meetings, informal daily meetings, shared goals, joint-planning, problem solving and sharing ideas	Full access to operational and strategic information, relatively low quality information	Relatively low coordination of material flow, high stock levels, obsolete stocks, real-time access to stock levels and WIP	ERP system, communication tools: email and phone.
	External Supplier Integration	No regular contact, seasonal visits to suppliers, lack of mutual understanding and dedicated resources	Limited and infrequent sharing of operational and strategic information, no real-time access to information, low quality information	Low coordination of material flow, no inventory management initiatives, no real-time access to stock levels, no dedicated resources	Communication tools: email, phone and fax.
	External Customer Integration	No regular contact or periodical meetings, seasonal meetings during visits by customers, mutual understanding, no dedicated resources	Infrequent sharing of operational and strategic information, no real-time access, relatively low quality information	Low coordination of material flow, no inventory management initiatives, no real-time access to stock levels, no dedicated resources	Communication tools: email, phone and fax

Table 5.3: A summary of integration across Supply Chain C

Although the internal departments appeared to be well integrated, integration with suppliers and customers was not given equal attention. The production and supporting functions appeared to work closely through sharing full information, joint-planning and sharing goals. However, there did not appear to be a smooth flow of material within the company. Suppliers and customers did not appear to have a close coordination of information and material flows.

5.4 Case Study D

This case study consists of a garment manufacturer in Jordan, being the focal company, a supplier in Dubai, a supplier in China and a customer in the USA. The supply chain for Case Study D is shown in Figure 5.10 below.

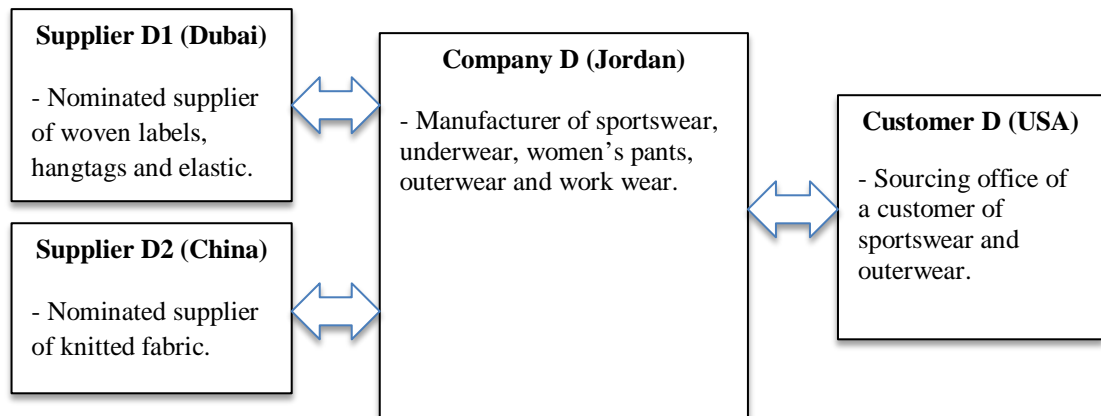


Figure 5.10: An overview of participating companies in Case Study D

5.4.1 Company D

Company D is a leading Middle Eastern manufacturer of underwear, sportswear, women's pants, outerwear and work wear located in Jordan. It was established in 2003 at one of the qualifying industrial zones in the country. The company is classified as a large manufacturing company with over 9000 employees and is the largest exporter in the garment industry in Jordan making approximately 12% of the total garments exports from the country. The company produced more than 25 different global fashion and commodity brands to several global retailers making over GBP 105 million of export sales in year 2013.

Organisational Structure

The company has a Chairman and President who are not directly involved in the business operations. The president and Financial Controller are based at one of the company production facilities and mainly involved in the strategic business operations. The Operations Manager is responsible for supervising the production and supporting functions. It's worth mentioning that there were several merchandising managers who are responsible for handling merchandising teams where each team was responsible for handling a customer account. A simplified organisational chart for Company D is shown in Figure 5.11 below.

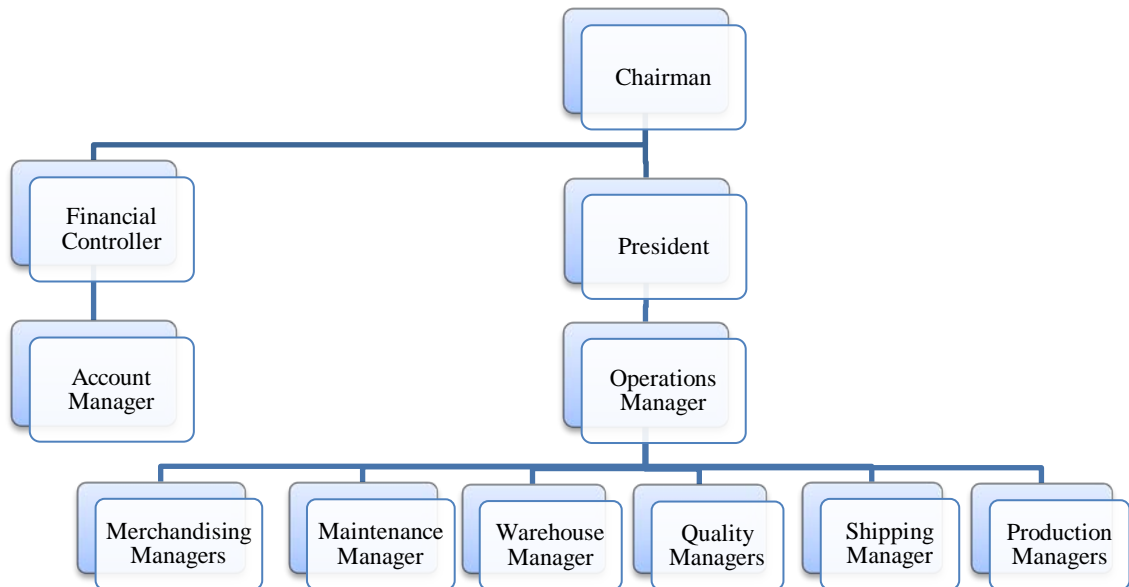


Figure 5.11: The organisational structure for Company D

5.4.2 Suppliers

Company D insources its direct raw materials of fabric and trim from more than 50 nominated suppliers located overseas mainly in China, Pakistan, India, Taiwan and Dubai. For the supply of secondary materials such as poly bags, hangers and cartons, the company depended completely on Jordanian manufacturers who are mainly located in the northern and central Jordan. One major trim supplier, Supplier D1, and one major fabric supplier, Supplier D2, were involved in this case study as introduced below.

- **Supplier D1**

Supplier D1 is the Middle Eastern office of a global producer and supplier of trims and accessories for garment industry based in Dubai. The company was established 1987 and in 2012 had offices in more than 60 countries over the world and employed approximately 700 staff. The company's range of garment-making products include woven and printed labels, hangtags, patches, stickers and tapes, elastic trim and backer cards. The Middle Eastern office serves several countries in the area; in Jordan the company had 3 major customers.

Supplier D1 was nominated in 2005 by Customer D to supply Company D with elastic tapes, labels and hand tags. Supplier D1 is the largest trim supplier for Company D making approximately 25% of Company D purchases of trim in 2012. Company D is

considered Supplier D1's top customer in Jordan and the whole Middle East making approximately 15% of Supplier D1 total sales of trim in the same year.

- **Supplier D2**

Supplier D2 is a privately-owned producer of knitted fabric located in China with approximately 200 employees. Supplier D2 was established in 2001 with a fabric mill in Hong Kong where all orders are despatched for customers. The internal structure of the company consists of six separate departments. However, all international customers were handled by the General Manager who is also the owner of the company. The company's major customers are mainly located in China, Egypt, Cambodia and Jordan.

Supplier D2 has been supplying Company D with knitted fabric since 2008. Supplier D2 is one of the largest suppliers of Company D making around 30% of its purchases of knitted fabric. For Supplier D2 this comprises around 15-20% of its total sales.

5.4.3 Customers

Company D produces over 25 global leading brands for approximately 18 major customers mainly located in the USA. The majority of the company's customers had agents who were responsible for interacting with their vendors such as Company D. These customers had originally chosen Company D as a vendor for the attractiveness of Jordan's geographical location, the low cost of production and the FTA agreements with the USA based on which garments are exported duty and quota-free. However, the company was able to retain its customers based on the excellence customer service it provided to its customers through dedicated customer service teams. One major customer was involved in this case study and is referred to hereafter as Customer D. An overview of Customer D and its business with Company D is introduced below.

- **Customer D**

Customer D is a global retailer of apparel essentials including sportswear, women's, men's and kids' underwear, socks and casualwear. It was established in 1965 as an incorporated company in the USA and in 2012 had around 50,000 employees. It operates a buying office in Jordan in order to improve the communication levels with its five vendors in the country. This buying office which was established in late 2011 has a General Manager, a Purchasing Representative, and three Communicators. This office is linked with the US headquarter through conference calls and email communication as well as mutual visits. Prior to establishing the Jordan Buying Office, the orders of

Jordan's vendors used to be handled through Customer D's office in Turkey which was shut down in 2011.

Customer D is a customer of sportswear and outerwear for Company D since 2005. The relationship is moderated by the Customer D's buying office in Jordan. Customer D is Company D's largest customer making around 45% of its total sales equalling GBP 52 million in 2012. Company D is the largest vendor of its women's and men's garments in Jordan making around 10% of its purchases of sportswear and outerwear from vendors around the world.

5.4.4 Case-by-case Analysis: Case Study D

Data collected for this case study involved evidence from several sources across the supply chain. From the focal company, Company D, six major face-to-face interviews were conducted with the Merchandising Manager, Export Logistics Manager, Import Logistics Manager, Operations Manager, Quality Manager and Production Manager. Three follow up interviews were conducted with the Export Logistics Manager, Import Logistics Manager and Production Manager. Direct observations were made during four sites visits to two production facilities and managers' offices and twenty five internal company documents were collected. From the buy side, two suppliers were involved in this case study, Supplier D1 and Supplier D2. One telephone interview was conducted with the General Manager of Supplier D1 and two telephone interviews were conducted with the General Manager of Supplier D2. From the sell-side, one customer, Customer D, was involved in this case study. A face-to-face interview was conducted with the Purchasing Representative of Customer D. Figure 5.12 summarises the respondents and number of interviews collected across Supply Chain D. Customers such as Customer D give orders to Company D with nominated suppliers such as Supplier D1 and Supplier D2. Therefore, Company D adopted a make-to-order strategy by which raw materials are only sourced after winning an order and making sourcing arrangements with the nominated suppliers.

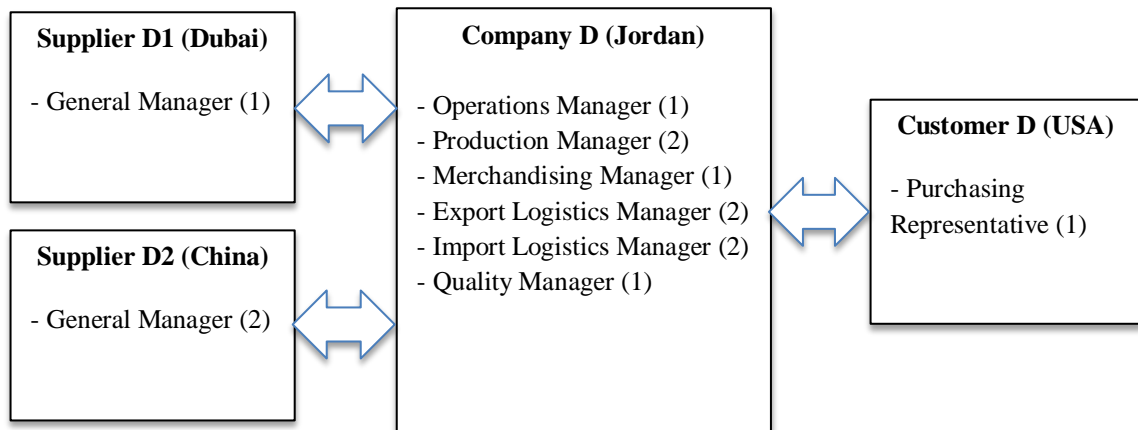


Figure 5.12: An overview of the respondents and number of interviews across Supply Chain D

Internal Company Integration

Internal Actors' Integration

- **Cross-functional Teams**

There were weekly, monthly, annual and informal daily meetings conducted between the production and supporting departments. The Merchandising Manager explained:

“We have weekly and monthly meetings as well. Senior management meetings include the managers who meet once a month. Weekly meetings include the General Manager and the other departments... what you might bring to the table may not be the best. What you might bring to the table, others might accept or not. Others may be able to implement these things in their departments and they might succeed.”

The Import Logistics Manager supported this view:

“There is a weekly meeting between production, merchandising and the warehousing. This is because these people need to get in contact regularly. These are arranged meetings. But for the major departments it is once in 3 months... everyone in the meeting can give suggestions, you can give suggestions, and a third person can give suggestions. Senior management will listen to suggestions and they decide what to do.”

Documents D-13 showed recommendations based on a weekly departmental meeting. Actions were taken and circulated to the departments involved. Document D-13 showed the agenda for the company annual management review.

There appeared to be an understanding of the importance of conducting periodical meetings amongst the production functions. These meetings appeared to be important to share ideas and knowledge amongst departments but also to solve problems.

- **Joint Planning and Shared Goals**

There seemed to be an understanding in Company D of the importance of interdependence amongst departments. This was clearly supported by senior management who seemed to believe in the importance of collaboration amongst the different functions to improve the efficiency of the internal operations. The Merchandising Manager explained the importance of senior management's role in building the collaboration environment in the company:

“Our teams are skilled and senior management with us is like friends. Senior management is friendly with managers. So managers transmit that to the lower level workers. That is behind our success.”

He further elaborated and explained his experiences at the Merchandising Department and how they can improve the work conditions through sharing experiences.

“For me if you ask me, I have a team of six people whom I sit with every week to take details from them. Then I ask them how we can improve the conditions. We need to keep improving to stay the best in the future. We discuss how we can work in a timely manner and how we can complete the jobs and take decisions within a timeframe. All these things we discuss. We share our experiences.”

This view was supported by the Production Manager who explained that there is always sharing of ideas and knowledge amongst the production functions and that he always listened to the workers' ideas:

“For example, in production we are following Lean System. Now we are going to make Modula. This idea we got from our workers. This is going to reduce our costs and working hours.”

The Production Manager provided an example of how his department supports other departments where possible:

“This is a chain including production, merchandising and quality. We are all together, for example, if purchasing will source people. How are these people sourced? We need to go to different countries together and conduct interviews.”

There seemed to be an understanding of the importance of joint-planning and sharing goals in Company D. The role of senior management was supportive for creating this collaboration amongst the production and supporting functions.

Internal Information Integration

- **Operational Information**

The Operations Manager explained that operational information is shared on a daily basis and that the ERP system offers real-time access to such information. Documents D-6, D-7, D-14 and D-15 contained operational information shared amongst the production and supporting functions. This was shared regularly and included information about production plans, stocks levels, customers purchase orders, raw material delivery, garments delivery and time and action plans. The Export Logistics Manager explained:

“For our department we need to know how many containers we need every week and which for purchase orders and which vessels per week we are planning. Also we need to know when we can load. All this we can get from merchandising department. After that we will find how many containers we need. And then we will need to find how we can load after communicating with planning and merchandising departments... we share information regarding export especially with merchandising team, we share shipping schedules... and they send us all export details.”

The quality of operational information shared amongst department seemed to be high however; the accuracy could be an issue in some cases. The Merchandising Manager, Operations Manager and Production Manager explained that some critical information needs to be double checked before an important decision is taken. The view of the Operations Manager was:

“Sometimes we cannot depend 100% on the updates given, sometimes we need to cross-check for the things that are important to us and we investigate it... I will need to ensure that things are correct in order to get it in place.”

Company D shared significant meaningful information amongst the different functional departments through emails and the company ERP system.

- **Strategic Information**

The Operations Manager and Production Manager explained that strategic information was mainly shared during the weekly, monthly and annual meetings conducted amongst the production and supporting functions. Document D-13 showed a range of strategic information that was shared amongst departments at the annual meeting such as promotion procedures and plans, reducing working hours and annual evaluation. The Production Manager explained:

“Strategic information is shared during the weekly and monthly meetings. We discuss business issues and what happened the previous week.”

Although there was little evidence on the quality of strategic information shared, the Merchandising Manager, Operations Manager and Import Logistics Manager explained that the strategic information shared internally was accurate. There did not seem to be any concerns about the quality of strategic information shared amongst departments.

The production departments in Company D recognised the importance of sharing meaningful strategic information. This information was mainly shared during periodical departmental meetings.

Internal Material Integration

- **Standardised Procedures**

There was a low level of inventory held as a buffer stock for any possible defects or order adjustments. However, since all fabrics suppliers were located outside of the country, the company needed to order materials around 8 weeks in advance. Upon the arrival of raw material in the company warehouse, it gets entered into the ERP system so that its details are available to the production and supporting functions. The internal ERP system seemed to have an impact on managing the material flow within the company. The Merchandising Manager explained:

“... We do not keep extra stock. When we buy the raw materials and upload their details on multi-mission. This helps us to know how much we need to buy for the next orders. The system does not accept buying extra materials so we cannot produce a purchase order.”

The Import Logistics Manager explained that significant operational information about materials is accessible on a real-time basis which helps coordinate material flow efficiently. He explained that the ERP system allows access to:

“All the information such as stocks, bookings, supplier details, export goods details, costs, how much quantity we used and how much we received and all information from A-Z.”

Company D production and supporting functions recognised the importance of collaboration for managing material flow within the company. The make-to-order production strategy seemed to affect the level of materials the company kept in stock.

- **Close Coordination**

The production and supporting functions at Company D discussed the work-in-progress and the available raw materials during the daily ad-hoc meetings. Moreover, the

different functions share information about the details of materials. The Production Manager explained:

“If we want to get any details we can get them through Multi-mission including details about daily shipments, daily production, and daily activities, and how much is your production.”

The Import Logistics Manager and Export Logistics Manager explained that they coordinate with the different functions within the company ensuring the smooth follow of material. The Export Logistics Manager explained:

“For our department we need to know how many containers we need every week and which for purchase orders and which vessels per week we are planning. Also we need to know when we can load. All this we can get from merchandising department. After that we will find how many containers we need. And then we will need to find how we can load after communicating with planning and merchandising departments...”

The production and supporting functions at Company D worked closely to coordinate the flow of material within the company.

Internal Technological Integration

- **Information Sharing Systems**

The company had an internal information system for information sharing amongst the different functions known as Multi-mission. This system was accessible by the production functions within their specialities. The Merchandising Manager explained that the Multi-mission system was developed by the company IT department in a way that made it customised to the company’s needs and operations structure. The Production Manager explained the benefits of this information sharing system:

“We have a system called Multi-mission. If we want to get any details we can get them through Multi-mission including details about daily shipments, daily production, and daily activities, and how much is your production. It is like an online system.”

Company D appeared to have a customised ERP system for the company operations. The system connected all the production departments and is considered the main source of accessing operational information.

- **Communication Tools**

The observation suggested that Company D used email and phone for transferring information amongst departments. The Merchandising Manager, Production Manager, Import Logistics Manager, Export Logistics Manager, Production Manager and Operations Manager agreed that emails are seen as the major way of communicating

amongst all the company internal departments followed by The Multi-mission system. A typical explanation was provided by the Merchandising Manager:

“We have a planning department that shares all the updated plans every week through email. So we have coordination through emails. Whatever I have it will be shared via email every week. And it is the same for other departments.”

Emails were seen as the main medium for sharing both operational and strategic amongst the different departments within Company D.

External Supplier Integration

Supplier Actors Integration

- **Long-term Relationships**

Visits were made by Company D’s senior management to their suppliers every 6 months. Moreover, the company has established a sourcing office in China where a large number of its suppliers existed. However, the Merchandising Manager, Operations Manager, General Manager of Supplier D1 and General Manager of Supplier D2 explained that the suppliers’ visits were limited to regional visits to the Middle East or Jordan when there was a need to visit a number of manufacturers.

The General Manager of Supplier D1 explained that they have assigned an account manager for managing the Company D’s relationship:

“Because the business is large enough with (Company D) that I can have a dedicated customer service... this is very useful as it improves the service level... we had in the past an account manager based in here but this did not add any value... the account manager was based in Jordan for serving all our customers in the country and not only for Company D. However, it did not add significant value.”

Company D had a single investment in the relationship being a sourcing office in China for all those suppliers who are in that region. Moreover, some of the company’s major suppliers had dedicated customer services for Company D. When the Import Logistics Manager was asked about whether there have been sacrifices in the relationship they have with suppliers, he explained:

“They are not sacrifices. If we face an issue with fabric quality we ask the suppliers to replace it. So if we reject it then they replace it. It is not a sacrifice but it is rather a business adjustment.”

The Production Manager, Merchandising Manager and Import Logistics Manager and the General Manager of Supplier D1 believed that the business relationship is expected to continue with the major suppliers for longer periods. The General Manager of Supplier D1 explained:

“It (the relationship) lasted. The relationship with them (Company D) has been for the last 10 years.”

Although the limited dedicated resources did not indicate that there will be a committed relationship, these investments appeared to be an important factor in the relationship that Company D had with its major suppliers.

- **Mutual Understanding**

The Merchandising Manager explained that there is a mutual understanding between the company and its suppliers as to the importance of the relationship:

“We have to have understanding of our suppliers to be in this game. You have to keep the supplier in the place so that you can get the right raw material. If the customer is happy then you are happy and the supplier is happy.”

He further explained his view by providing an example:

“For example, you are a new supplier to (Company D) and we are new to the supplier. In the beginning we pay when we place the orders because we do not have any previous business with them. What we do is that we pay 70% of the goods value then we pay the remaining balance when the products are ready. This is at the initial stage. At later stages, they will say that we already know Company D then they will start production because they know we will pay for them.”

The Production Manager explained his view:

“Sometimes we get fabrics issues. When we call them or send them they come here. They come to solve the problem based on the agreed quality. And they come every 5-6 months to maintain our relationship. Sometimes we visit them in China, Italy and Egypt to keep the relationship with them.”

Some interviewees considered that communication difficulties because of language difference might be an issue with Far Eastern suppliers. For instance, when the Merchandising Manager was asked about whether Company D has difficulties in communicating with suppliers because of language, he commented:

“Of course we do. If you deal with Chinese, some people do not know English. We have difficulties, however; we still try to manage and move forward.”

He further elaborated on his view and explained:

“One supplier we have with them a better understanding and we have been doing the business with them for ages so they are like friends now. For these even if we delay the payment they will ask us why not you paid on time but it is still ok. Some other suppliers, like Chinese suppliers, they say if you do business with them 10 times or 100 times, if you pay money you take the material. There is nothing there is no relationship... 95% of suppliers in the Far East depend on only payments. The relationship is secondary. The payment is first to them.”

In fact, Company D struggled to suggest a fabric supplier who can speak English to participate in this case study research. However, eventually the company suggested Supplier D2 as the best supplier to communicate in English. The issue of language was also clear from the two interviews that were conducted with the General Manager of Supplier D2.

The results of the discussions reflected that there was caution when talking about having a full trust in the relationship. For instance, the Merchandising Manager believed that:

“In today’s world you cannot trust everybody. You have your own knowledge and experience”.

The level of mutual understanding appeared to be different from one supplier to another. Although mutual understanding existed with some major suppliers, it seems that the company is not very convinced of the level of mutual understanding with the Far Eastern suppliers.

There seemed to be a limited mutual understanding in the relationship between Company D and its suppliers. There seemed to be a certain level of understanding of the importance of having a long-term and close relationship between Company D and its suppliers. The relationship appeared to have a dedicated customer service by the major suppliers.

Supplier Information Integration

- **Operational Information**

Operational information was shared with suppliers mainly via email through the merchandising team after it has been taken from the relevant department. Similarly, information transferred from suppliers is first received by the Company D merchandising team before being distributed to the relevant departments. The Operations Manager explained that there is no sharing of operational information unless there is an order and is limited to order specifications and quality guidance. This information included delivery lead time, production information and shipping mode.

Documents D-7 and D-9 are email communications with one of Company D's suppliers which showed sharing of operational information about fabric details, shipping information and quality inspection information.

The Merchandising Manager explained that to ensure the accuracy and trustworthiness of information, market experience was essential. When he was asked about the way they ensure the accuracy and trustworthiness of information, he explained his view which was also supported by the Production Manager and the Operations Manager:

"We cannot investigate to that level because they are in China. When I get some details I use my market intelligence. For example, if they tell me that that price of a product is USD 2 then I can double check it on the internet."

There appeared to be infrequent sharing of operational information between Company D and its suppliers. This type of information is shared when there is an order and when requested by Company D.

- **Strategic Information**

Company D planned its orders ahead of time with the nominated suppliers based on market information received from the customers. The orders for a particular season are agreed on by both parties although they may vary according to order adjustments from customers which do not happen regularly. The General Manager of Supplier D1 explained that there is sharing of strategic information with Company D including projections, market information and new buyers. The General Manager of Supplier D2 explained:

"Every meeting I give some advice to them (Company D). I give them information about the market situation. I also give them information about business in China."

The Merchandising Manager explained that strategic information is transferred upstream in the supply chain to the raw materials suppliers:

"What we do is that we work with the customers and we take the forecasting and we pass it to our suppliers. So we say keep an eye on raw materials... we say this is our forecasting but it is not a confirmed order. We do not foresee but we ask them to watch what is going on with raw materials because the raw materials prices always fluctuate."

However, the observation suggested that most strategic information was decided and transferred by customers.

Strategic information is mostly sent in one direction from Company D to its suppliers. The quality of this information is deemed to be high unless the customer order was adjusted which rarely happens.

Supplier Material Integration

- **Standardised Procedures**

Company D had limited identified procedures for sourcing materials from suppliers based on different shipping modes. The Import Logistics Manager explained the context of shipping in a simplified way that showed the basic procedures followed for moving materials from suppliers to Company D:

“If I get an order from the relevant merchandiser, this order will contain all the data including the name of the supplier, the shipping terms, the shipping mode and the date window. Based on this email I check with the supplier and I arrange the booking through the forwarder or the shipping lines. Accordingly, I plan the shipping mode... I decide according to rate. I go for the forwarder who gives me the good price.”

Company D did not have any inventory management initiatives with its suppliers. Company D arranged the material sourcing after receiving a confirmed order from its customers. However, the nominated suppliers were nominated by the customers ahead of time in order to ensure that the fabrics needed were available. The General Manager of Supplier D2 explained:

“When they (Company D) confirm the order we discuss the delivery and production schedules issues. All dates should be confirmed otherwise I cannot start production.”

Company D had limited standardised procedures with its suppliers. Most of the procedures were limited to shipping terms and there were no identified initiatives for inventory management.

- **Close Coordination**

There did not seem to be much collaboration in managing the material flow between the company and its suppliers. There was no real-time access by Company D or its suppliers to the stock level or material information of the other partner. The General Manager of Supplier D2 explained that the collaboration in managing material flow is limited to working based on the shipping terms agreed on:

“All depends on the shipping terms we (Supplier D2) agree on with (Company D). The terms could be FOB or CIF. The shipping from China to Jordan is most of the time by sea.”

There was not much for suppliers to do to coordinate material flow except for handing over materials to the relevant forwarder and preparing the shipping paperwork. However, in some few cases where the shipping term is Cost, Insurance and Freight (CIF) the carrier handles the shipping and did not seem to intervene under the other terms.

Generally, the company had limited standardised procedures and coordination of material flow with its suppliers. There was a lack of understanding as to the importance of achieving higher material integration with suppliers.

Supplier Technological Integration

- **Information Sharing Systems**

Company D did not connect with its suppliers through information sharing systems. There was no real-time access to information by either party or an EDI technology. The Import Logistics Manager explained:

“We send them (suppliers) emails which have information based on which they can plan their production and ship the goods to us. However, they cannot access our information nor we can access theirs.”

The General Manager of Supplier D1 supported this view and explained that there were no dedicated information sharing systems with Company D and information sharing was through emails. However, he showed willingness to invest in a dedicated technology with Company D if it was required.

The company and its suppliers seemed to be satisfied with the way information was shared. However, there was a willingness by Company D’s supplier to make such an investment if it was required.

- **Communication Tools**

Company D used emails, phone and conference calls for communicating with its suppliers. Almost all the operational information was transferred through emails. Conference calls through Skype were arranged in some instances. The Merchandising Manager explained:

“...one supplier might communicate via email and phone. Others might communicate via Skype and emails. But the main tool is the email.”

Document D-9 showed an example of how information was shared through email communication. Emails appeared to be the most frequently used communication tool

followed by phone and conference calls. There seemed to be satisfaction at Company D and its suppliers with the way information shared through communication tools.

External Customer Integration

Customer Actors Integration

- **Long-term Relationships**

The Merchandising Manager and Production Manager explained that there were regular mutual visits between Company D and its customers every 3 months. The Operations Manager and the Merchandising Manager explained that their customers made regular visits to the company production facility in order to discuss day-to-day operations. The Import Logistics Manager explained that their customers visit them to ensure they meet the standards and can meet expectations:

“There are some rules and regulations which we (Company D) need to meet. So they (customers) need to make sure that our company have the right number of workers and make sure the work environment is excellent at our company.”

Company D assigned account teams for each customer. Each merchandising team of 3-4 people is responsible for handling the enquiries of a single customer. The Merchandising Manager explained the purpose of having these teams:

“An account manager is a leader so he should lead the team. You cannot have 10 different people dealing with the customer. So you need to take the responsibility for all the areas of your customer. If a customer is having a problem with raw materials they will call you, if the customer has a problem with production they will call you, if the customer has a problem with shipping they will call you.”

The purchasing Representative of Customer D explained his view about these teams:

“They can address some urgent requirements faster than some other vendors because of this specialised team they have, and they can provide information in a fast way. So of course it gives an advantage. That’s why they have more volumes than other vendors. They get more goods than other vendors... It is different from a team to another. For example we have other vendors but we do not have a team. It is only one person or two persons. So when you have one person doing more than one function is different from having a team where every person in that team is dealing with everyone’s function. So that would give you an advantage because you have somebody who is only working for shipping. He is an expert in shipping. It is not like having one person doing more than one function.”

There seemed to be a clear understanding by the company of the importance of having a close relationship with its customers. The relationship that company D had with its

customers was characterised by on-site visits, close communication and long-term planning.

Several dedicated resources existed in the relationship with customers including a dedicated and customised customer service, a web-based and integrated EDI system, customers Quality Representatives based at Company D production facility, and sourcing offices based in Jordan for some majors customers. Moreover, the respondents of both parties showed interest in accepting any initiatives for making future investments for the benefit of the relationship. For instance, the Purchasing Representative of Customer D explained his view:

“...I am not sure if we can do more to have even better than the system we have. But if there is something yes why not. But right now everything is going smoothly. Our system is good and it is addressing all the requirements.”

He explained that there is a commitment in the relationship with Company D:

“We have commitment together. They are dedicated and they are working hard to serve (Customer D) and we are also working hard to provide them with everything they need so that they can meet our requirements.”

The Merchandising Manager explained:

“Sometimes they may pay to (Company D) more than competitors in order to keep (Company D). You cannot leave a vendor just because it is cheaper with a penny.”

There seemed to be commitment in the relationship that Company D has with its customers. Several dedicated resources and sacrifices explained that the relationship would be costly to terminate.

- **Mutual Understanding**

There did not seem to be any issues concerning the relationship because of the language difference. The Operations Manager, Merchandising Manager, Production Manager and the Purchasing Representative of Customer D confirmed the relationship with Company D had no communication difficulties.

A close relationship based on mutual understanding existed between Company D and its customers. The Purchasing Representative of Customer D explained that there is mutual understanding and that both parties count on each other:

“They (Company D) handle urgent requests pretty quickly. Sometimes we count on urgent requests. They have flexibility, they work fast, and they have good relationships with suppliers. As I said they have a team specialised only for us (Customer D).”

Company D seemed to appreciate the importance of building a relationship with customers that is based on mutual understanding. The relationship seemed to enjoy a good level of mutual understanding although it might not be at a partnership level.

Customer Information Integration

- **Operational Information**

Sharing of operational information happened at different stages during the order development, production and delivery. The Purchasing Representative of Customer D explained that there was always sharing of meaningful operational information with Company D:

“We can ask and there are reports that are sent every week. And if we need more information we can ask...anything regarding to delivery anything regarding to production, to capacities, it is reliable of course we depend on their information... Any information that comes from vendors is very important for us we look at it closely.”

Likewise, The Operations Manager, Merchandising Manager, Production Manager and Import Logistics Manager explained that operational information received from customers is considered as trustworthy and accurate. However, most of the operational information was transferred in one direction from Company D to its customers.

There appeared to be significant sharing of meaningful operational information between Company D and its customers. The importance of sharing this information was recognised by both the company and the involved customer.

- **Strategic Information**

Company D seemed to appreciate the importance of sharing strategic information with its customers. This type of information was essential for the company in order to plan its capacity for the following six months. The Operations Manager explained that planning with customers is important:

“Because we have a huge production facility and we need to distribute work to workers. We have now 9,000 workers and around 2,500 machines, so we need to plan them for at least six months in advance.”

The Merchandising Manager explained that there is planning with customers for the next period of time:

“We meet every three months and we discuss with them the forecasting they have. We ask them how the business is and how we are going to move forward.”

The Purchasing Representative of Customer D explained:

“We share anticipated forecast, we share style constructions, we share specifications of the goods and we share the requirements of the customers. Anything that would help them meet the delivery of goods on time. Even though we might not have a solid Purchase Order (PO) but if we think that we might have a PO we can share all the information regarding that subject, so that they can come up with plans and they see if they can meet the delivery or not.”

There appeared to be significant and regular sharing of strategic information between Company D and its customers.

Customer Material Integration

- **Standardised Procedures**

Company D had a limited intervention in the shipping procedures which were identified by its customers. The Operations Manager explained:

“All (customers) have nominated shipping lines. Our responsibility is to deliver products to the port of Aqaba and then their shipping lines handle the products. From the port it is then their responsibility.”

The Export Logistics Manager similarly explained further:

“All (carriers) are nominated by customers. Every customer has a nominated shipping company. For example, (Customer D) has APL and another customer has Maersk Lines. So we cannot use any other forwarders. We have to use the nominated forwarders... so if there are any problems with carriers the customer will take care of this.”

Material details were transferred upon request either by email or EDI systems. The Export Logistics Manager explained the procedures for moving the finished garments:

“We have to give a notice of 45 days before booking with the shipping lines. The purchase order clearly states the shipping details which we use. The merchandising team coordinates with planning about when the products will be ready and handed over.”

The Purchasing Representative of Customer D explained that there are procedures that need to be followed and there is always close coordination if any problem arises regarding delivery:

“The good thing is that we have procedures. They follow procedures. And as long as you’re following the procedures in the correct way there are no problems at all. I mean everything is smooth... Sometimes they would come back to us asking about specific purchase orders if they are ok to ship on this date or if they are late. They said that they

had plans to ship something but could not make them out because of the snow storm last week for example. So they come to us and say we had this problem, they are booked, but we could not get them in the containers and now it will have to wait until next week. So sometimes in some situations they can come back to us.”

Company D appeared to have standardised procedures for managing the material flow with its customers.

- **Close Coordination**

The Purchasing Representative of Customer D explained the advantages of having a specialised merchandising team for each customer on smoothing the material flow:

“...as far as I know they have one person who is responsible for shipping of (Customer D) who is working with APL and he is only working with APL for (Customer D). In other vendors, you would have one person shipping with APL for (Customer D) and that one person is with another forwarder for another customer. So he is not specialised in APL and for (Customer D).”

The Purchasing Representative of the Customer D provided another example which explained the coordination in managing material flow with Company D:

“Sometimes we keep stock in their production facility; we keep contingency fabrics, contingency raw materials. When we book we ask them to keep like 50,000 yards or one specific fabric because we anticipate goods from that fabric so that we cut the lead time for that specific raw material and they work with us on this and they keep those stock levels.”

There seems to be a good level of collaboration in managing material flow between the company and its customers. There appeared to be a smooth material flow and a good communication level in material management.

Customer Technological Integration

- **Information Sharing Systems**

Company D did not connect with any of its customers with information sharing systems. There was no real-time access to information at either party. The Export Logistics Manager stated that:

“They (customers) always send emails and communicate via emails. There is no package such as multi-mission or any other packages.”

However, the company was connected with most of its suppliers with web-based and integrated EDI systems such as Retail-link, Vendornet, Zone and TeamSite applications. The Purchasing Representative of Company D explained that the EDI system was considered essential for sharing accurate information.

There was no information sharing system between company D and its customers. Company D customers seemed to be satisfied with the level of technological connection which was limited to EDI systems and communication tools discussed below.

- **Communication Tools**

The information sharing between Company D and its customers was mainly through email and less often the conference calls. Document D-6 showed email communication with one of the company customers. The Operations Manager, Merchandising Manager, Import Logistics Manager, Export Logistics Manager, Production Manager and Customer D’s Purchasing Representative confirmed that emails handled the information sharing in the relationship effectively.

5.4.5 Case Summary

Table 5.4 shown below provides a summary of how Company D integrated internally amongst the departments and externally with its suppliers and customers.

		Actors	Information	Material	Technological
Supply Chain Integration - Case D	Internal Company Integration	Periodical weekly, monthly and annual meetings, informal daily meetings, pre-production meetings, joint-planning, shared goals, problem solving, sharing ideas and advice	Full access to operational and strategic information, high quality information	Close coordination of material, low stock levels, real-time access to stock levels and WIP, identified procedures.	Customised ERP system, communication tools: email and phone
	External Supplier Integration	Nominated suppliers, sourcing office in china, mutual visits, a trustful relationship, conditional commitment	Infrequent sharing of operational and strategic information, no real-time access to information.	Relatively limited coordination of material, no real-time access to stock levels and production plans, no inventory initiatives	Communication tools: email, conference call and phone
	External Customer Integration	Dedicated customer service teams, periodical meetings, on-site visits, quality reps on-site, technological investment, mutual understanding, customers sourcing offices	Regular sharing of operational and strategic information, high quality information	Identified procedures, nominated forwarders, no real-time access to stock levels, close coordination.	Integrated EDI, web-based EDI, communication tools: email, conference calls and phone

Table 5.4: A summary of integration across Supply Chain D

Company D appeared to appreciate the importance of both internal company integration and external customer integration. However, there was less evidence of the importance of external supplier integration in this case study. The company made several investments for the benefit of integrating the internal production and supporting function and with customers.

5.5 Case Study E

This case study consists of a garment manufacturer in Jordan, being the focal company, a supplier in Italy and a customer in Turkey. The supply chain for Case Study E is shown in Figure 5.13 below.

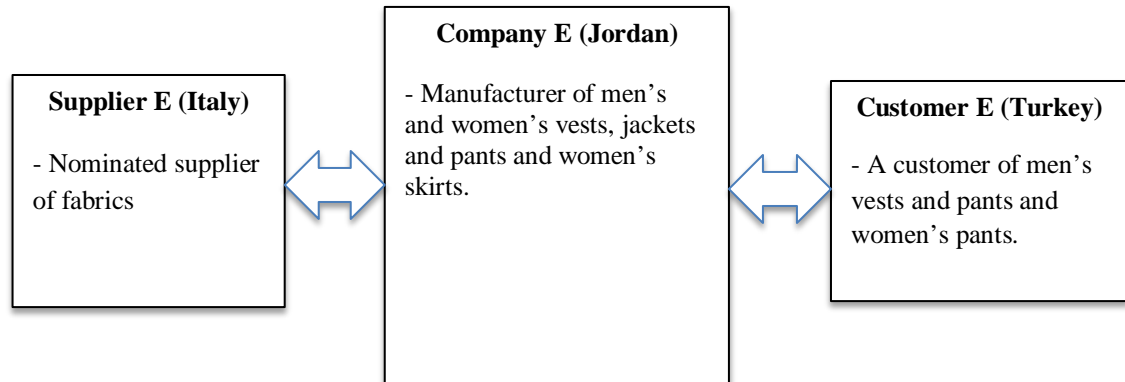


Figure 5.13: An overview of participating companies in Case Study E

5.5.1 Company E

Company E is a manufacturer of tailored pants, skirts, jackets and vests located in North-East part of Jordan. It was established in 2004 at one of the qualifying industrial zones in the country. The company is classified as a large manufacturing company with a total of approximately 1300 employees.

Organisational Structure

Company E has a General Manager who is based at the company production facility and is involved in strategic business operations. The Operations Manager, Production Manager and Merchandising Manager are involved in both strategic and operational business activities. A simplified organisational chart for Company E is shown in Figure 5.14 below.

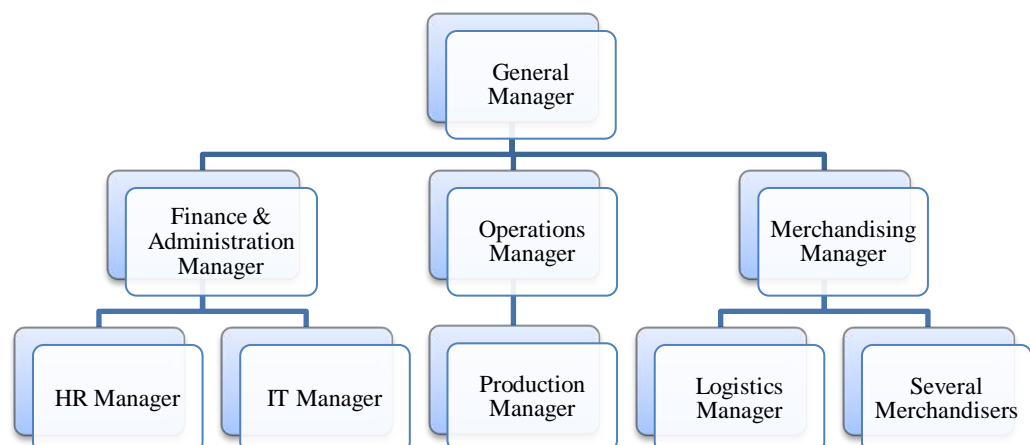


Figure 5.14: The organisational structure for Company E

5.5.2 Suppliers

Company E depended completely on nominated suppliers for sourcing its fabrics and trims. These suppliers were mainly located in China, Italy and Turkey whereas the suppliers of secondary materials such as poly bags, hangers and cartons were all located in Jordan. One major fabric supplier was involved in this case study and is referred to as Supplier E. An overview of Supplier E and its business with Company E is introduced below.

- **Supplier E**

Supplier E is a large-sized producer of wool and cotton fabrics, linen and wool yarns and silk based in Italy with approximately 3500 employees. The company was established in 1836 and in 2012 had 5 production facilities serving customers around the world with the US and Europe being the most prominent markets. The company turnover for year 2012 reached over 370 million Euros with fabrics making around 70% of the total company revenue.

Supplier E was nominated in 2008 by Customer E to supply Company E with cotton and wool fabric for its orders. Supplier E makes approximately 10 % of Company E purchases of fabric; this makes less than 2% of supplier E total sales.

5.5.3 Customers

Company E has 11 major customers who were mainly located in the USA and Turkey. All of the company customers had agents who were responsible for interacting with their vendors such as Company E. These customers have chosen Company E as a vendor for the attractiveness of Jordan's geographical location and the FTA agreements with the USA and Europe based on which garments are exported duty and quota-free. One major customer was involved in this case study and is referred to hereafter as Customer E. An overview of Customer E and its business with Company E is introduced below.

- **Customer E**

Customer E is a sourcing company for several US and European garment retailers of men's and women's wear based in Turkey. The company was established in 1995 and in 2013 had around 100 employees. The company vendors were mainly located in Egypt,

Jordan, Turkey and Morocco benefiting from the low production costs and the duty-free export to the USA and Europe from these countries.

For Company E, Customer E is a customer of men’s pants and vests and women’s pants. Customer E trading relationship with Company E started in 2004 and by 2012 it became its second largest customer making around 60% of its total sales, this makes around 20% of Customer E total purchases of women’s and men’s wear.

5.5.4 Case-by-case Analysis: Case Study E

Data collected for this case study involved evidence from several sources across the supply chain. From the focal company, Company E, six major face-to-face interviews were conducted with the Merchandising Manager, Logistics Manager, Operations Manager, Senior Merchandiser, Quality Manager and Production Manager. Two follow up interviews were conducted with the Merchandising Manager and Logistics Manager. Direct observations were made during three sites visits to the three company production facilities and managers’ offices and sixty internal company documents were collected. From a major supplier, Supplier E, one telephone interview was conducted with the Export Manager. From a major customer, Customer E, one telephone interview was conducted with the Purchasing Manager. Figure 5.15 summarises the respondents and number of interviews collected across Supply Chain E. Customers such as Customer E give orders to Company E with nominated suppliers such as Supplier E. Therefore, Company E adopted a make-to-order strategy by which raw materials are only sourced after winning an order and making sourcing arrangements with the nominated suppliers.

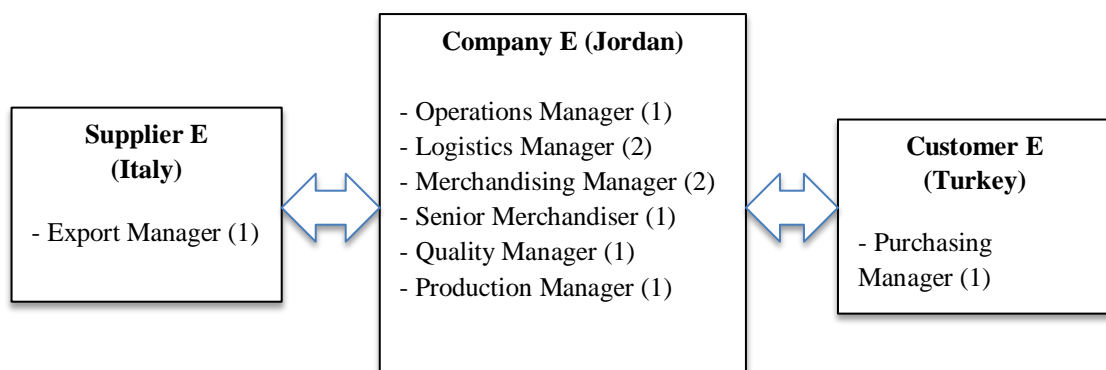


Figure 5.15: An overview of the respondents and number of interviews across Supply Chain E

Internal Company Integration

Internal Actors' Integration

- **Cross-functional Teams**

Company E conducted a weekly meeting amongst the production and supporting functions to update them about the production process and any arising concerns. The Merchandising Manager explained the purpose of this meeting:

“This is to coordinate the orders and to know if it is ready or it will be ready on time. We get to know if there are problems with production and whether there is delay in delivery or not... we meet to discuss the following week shipments and if there are any shortages or problems with production.”

A monthly meeting was also conducted to discuss the monthly performance report (Document E-38) and monthly shipment chart (Document E-24). These two reports contained detailed information about the operations performance in the previous month based on which procedures and recommendations were developed by the production and supporting functions. The Quality Manager explained that the different departments meet on a daily basis in an informal way to discuss the day-to-day business operations:

“We have a daily meeting with production and operations and pressing in charge and packing in charge. We meet every day to discuss the quality and shipments dates and updates of production.”

The Senior Merchandiser explained that the head of production functions meet on a daily basis to discuss any arising problems. Similarly the Logistics Manager explained that the company arranges special meetings should any problem arise:

“...if there is a need for a meeting to solve problems we do it but not very often. But in periodical meetings there are problem solving for production... every one introduces the problem he has and we solve it in the meetings. They are not about taking decisions but rather solving problems.”

Company E appeared to conduct daily, weekly and emergency meetings for the departments. These meetings seemed to be essential for problem solving and linking the departments through sharing point of views.

- **Joint Planning and Shared Goals**

The Senior Merchandiser explained that the company promotes sharing ideas for the benefit of the company. She stated that:

“In the meetings we conduct on a weekly basis and which include the General Manager, he listens to our suggestions and we participate in it. If we have ideas he has

no problem with accepting them...for us the most important thing is not to have miscommunication between the departments. All our business is based on communication so everyone needs to know what is going on.”

The Production Manager supported this view:

“...We give our ideas and discuss them. If they have been supported by everyone else then we try to implement them.”

The Merchandising Manager stated that:

“The General Manager focuses very much on collaboration amongst departments. Currently, we meet with even supervisors in our meetings and not only the departments heads. So there is interaction and communication amongst these people and the departments.”

The Logistics Manager provided an example to explain the interdependence and connection amongst departments:

“For example, I send them sometimes that there will be holidays on Wednesday and Thursday. So if you have ready garments to ship make sure you do so before Wednesday. I send an email to production and planning. So based on this they study the matter and see if they can make the shipping earlier. If I did not send them that Wednesday might be off then a gap might happen. This is the connection I'm talking about.”

The Production Manager provided a further explanation to reality in that he clarified how departments are interdependent and linked together:

“There is interdependency between these departments. For example, there is a good link between quality and production departments and there are always discussions amongst these departments because their decisions affect each other... We work as one unit. Decisions in any department would affect other departments. But we always discuss with each other any important decisions. Every department has goals and the company as whole has goals as well.”

There seemed to be interdependence amongst the production functions. The company seemed to encourage sharing of ideas and knowledge from other functions during the periodical meetings.

Internal Information Integration

- **Operational Information**

Information shared amongst the production and supporting functions included order status, quality updates, production schedules and stock levels. It was shared during the weekly meetings, informal daily meetings, email communication and report attachments as well as trim cards. Daily (Document E-36) and monthly (Document E-37) production

reports, and monthly shipping charts (Document E-24) were shared regularly amongst the production functions. The Production Manager explained:

“There is a daily report and monthly shipping report. This report is a result of gathering information from every department... Every week we discuss the important things in the meeting and we update all the necessary information. Anyone gets new information or amendments from previous information they tell us.”

Operational information shared between the internal functions seemed to be inaccurate in some cases. The Merchandising Manager referred this inaccuracy to that:

“Most workers are not educated and there is apathy sometimes... it is about the employees’ culture and understanding of the importance of information accuracy... the information shared is usually ready and you can send it to the customer as it is. However, in most cases I need to edit and send to the customers.”

The Quality Manager and Production Manager explained that there might be human errors so they needed to double check the information they received before forwarding to other departments. The Senior Merchandiser explained that inaccuracy would be minimised if there was an internal ERP system. This view was also supported by the Logistics Manager who explained that there was inaccuracy of operational information shared internally such as stock levels. He referred this to sharing of information through excel sheets which are seen as unreliable:

“Not every time you get information you can consider it accurate...you cannot say there are no errors. There must be errors when you deal with excel sheets because information is entered by human... it could happen that the information is not timely.”

The company had a significant sharing of operational information amongst the production and supporting functions. It was recognised by the company that information sharing is essential for performing their internal operations. However, there appeared to be inaccuracy in this type of information which mainly referred to the lack of an internal information sharing system.

- **Strategic Information**

The company mainly shared strategic information during the pre-production meetings conducted when there is a new won order (Documents E-9 and E-17). Documents E-1, E-2 and E-3 showed customer technical packages that were discussed during pre-production meetings by the departments. The different departments shared also the projections received from customers as well as the planning information for the following season. The following quote by the Senior Merchandiser explains the nature of strategic information shared between the production and supporting functions:

“We share strategic information in the weekly meeting. This meeting includes cutting, production, shipping, and planning... we share projections that we need to work on. For instance, for me I work on the running season and coming season... We share what we are going to produce and what the projections are... this is to keep the production running and not to have problems in the future... there is usually no big discrepancies in this information. However, I cannot confirm to the customer the delivery date without revising it... this is just to be in the safe side.”

The above quote explains that there were no issues concerning the quality of strategic information and that it was double checked before being transferred downstream in the supply chain. There seemed to be regular sharing of strategic information amongst the production functions.

Internal Material Integration

- **Standardised Procedures**

The company sourced fabrics and trims following winning a new customer order. However, the company stocked raw materials for longer periods and future orders for some customers. The Merchandising Manager clarified her experiences with some customers:

“... For some orders the customers tell us that we need to work this model for 2-3 years. So we keep stock and produce based on the customer order. However, this is based on the agreement with the customer and if the customer has not used the materials, then this is a liability for the customer who needs to pay its cost”.

The Documentary (Document E-24, Document E-36; Document E-37) and observational evidence as well as the several quotes by the Logistics Manager and Merchandising Manager in the previous section suggested that daily and monthly production reports and monthly shipping charts were shared regularly amongst the production and supporting functions.

The company appeared to have relatively standardised procedures for the management of material flow amongst the production and supporting functions. However, the company had stock control issues as clarified in the next section.

- **Close Coordination**

Company E seemed to have an understanding as to the importance of collaboration amongst the production and supporting functions in managing material flow within the company. When the Logistics Manager was asked about whether there is connection amongst departments in managing internal material flow, he stated:

“Of course, this is a must. If there was no communication or lack of information which might lead to shortage in materials the whole production will be paralysed. As a result the shipments will be delayed and there will be penalties... We meet to know the lead time... Every order has a quantity and we meet internally with the planning and production functions to discuss the material lead time for this order.”

Company E suffered from inaccuracy in the shared stock levels and difficulty in dealing with repeated customers' orders. Furthermore, the frequent sharing of stock levels through spreadsheets at Company E was inefficient due to the large volume of materials and number of stock-keeping-units (SKUs) managed internally. This problem of stock control appeared to be related to the lack of an internal information sharing system as explained by the Merchandising Manager:

“When there is a repeat customer order we cannot find how much material is left in stock. This is not so good at all. We always struggle with this point.”

There seemed to be a close coordination of material flow by the different functions within Company E. However, it appeared from the previous sections that depending on excel sheets for sharing operational information was unreliable.

Internal Technological Integration

- **Information Sharing Systems**

Company E did not have any information sharing systems for connecting the production and supporting functions. The Operations Manager, Merchandising Manager, Logistics Manager and the Senior Merchandiser explained that the company used an excel sheet through which information is updated. The Senior Merchandiser explained that the company had only:

“... a stock movement system (the excel sheet). That's it. For example, for customers there is a size label or main label. So if you get a large quantity this year you might need it next year. It is usually common materials.”

The Merchandising Manager, Senior Merchandiser and Logistics Manager insisted that the company needs such a system to facilitate timely sharing of information and transfer high quality information. The Logistics Manager view was that:

“...they (the departments) need a system that shows the styles, stocks and... there must be a system like this in this company. There has to be a system in the company to show the account and stocks. You are talking about huge amount of money and fabrics and materials that come in and go out of the company.”

The Merchandising Manager's view was:

“I think we need such system because it is not efficient to depend only on emails and excel sheets. I worked previously in other companies in clothing industry and I know that such system is needed to reduce the errors and increase the responsiveness between departments... it is not efficient to keep sending emails and reports about the production status and stock levels. These reports can easily contain errors.”

Company E did not have any system that offers a real-time access to information within the company. Although all the respondents from Company D confirmed the importance of having internal ERP system, it seemed that there is a lack of understanding of the importance of internal technological integration by senior management.

- **Communication Tools**

Emails were the main communication tool for information sharing such as updates on production status, order details, daily, weekly and monthly production reports. The Merchandising Manager, Senior Merchandiser, Logistics Manager, Operations Manager and Quality Manager considered emails as the key tool for transferring information however, most of these respondents believed that a dedicated internal information sharing system is necessary for connecting the different functions. The Merchandising Manager explained:

“Email and shared folder is not sufficient to handle the business we have within our company. For example, when there is a repeat customer order we cannot find how much material is left in stock. This is not so good at all. We always struggle with this point.”

Documents E-23 to E-39 are internal communication, daily and monthly production and performance reports which were all shared amongst the different departments through email. This supported the view that email was the main medium of sharing operational information in the absence of an ERP system.

External Supplier Integration

Supplier Actors Integration

- **Long-term Relationships**

The Merchandising Manager explained that all their suppliers were nominated and the development stage was performed through customers. The Export Manager of Supplier E explained that the relationship with Company E existed because of Customer E who nominated them. There were no regular visits and the relationship was based on communication through emails:

“...the relationship with (Company E) is because of (Customer Name). Before we started dealing with (Customer Name) we did not know (Company E)...it is a good relationship with them (Company E) but I am not sure if it is special or not... they tell us how many meters of fabrics they need during the season and when they need them. So when we have this piece of information we start working on it. Then we discuss when we will be able to deliver. Sometimes we need to anticipate things and they may ask us to postpone. This is the daily relationship with them.”

The Logistics Manager explained that their suppliers visited them every 3-4 months for problem solving and quality assurance. However, his view was that Company E did not build close relationships with its suppliers:

“...it is characterised by performing the day-to-day business transactions with them (suppliers). There is no real relationship with them. They do not encourage developing a relationship.”

Supporting the previous view, when the Senior Merchandiser was asked about whether the company has long-term planning with its suppliers, she expressed her view as:

“No, not the way we do it with... customers. At the end the supplier needs payments from us rather than orders.”

The company did not seem to have strong long-term relationships with its suppliers. All the company fabric and trim suppliers were nominated by customers and communication was mainly made through emails.

There did not seem to be any sacrifices in the past that would give an indication of relationship commitment between the company and its suppliers. Sacrifices from the past appeared to be limited to price reductions and giving longer credit terms. Moreover, there were no dedicated resources in the relationship with the suppliers which would indicate a long-term commitment.

The Export Manager of Supplier E explained that the relationship with Company E is affected by the relationship with Customer E who nominated them:

“The relationship has been for 3-4 years with them... the relationship with (Company E) is because of (Customer Name). Before we started dealing with (Customer Name) we did not know (Company E).”

The commitment factor seemed to be affected by the model of nominated suppliers that existed in the relationships. The commitment with suppliers was expected to continue as long as there are orders from the customers who nominated them.

- **Mutual Understanding**

The Logistics Manager and Senior Merchandiser raised the issue of communication with Far Eastern Suppliers because of the language difference. However, they believed that this did not have a big impact on business with their suppliers. The Export Manager of Supplier E explained that there was no communication difficulty with Company E.

It did not seem that Company E developed a relationship based on mutual understanding with its suppliers. The Senior Merchandiser and Logistics Manager felt that suppliers do not always work for the benefit of the company but just perform the required transactions. Moreover, the lack of trust in the relationship did not seem to worry Company E due to the fact that the relationship existed not only between them and the suppliers but also between their customers and suppliers. Therefore, information was transferred from both Company E and the customers

The Logistics Manager provided an example which explained that their suppliers were not interested in building closer relationships:

“If you order from the supplier 500,000 units and you already paid for these units then it is fine for the supplier, they do not care about other things. For them they keep in mind that they are nominated and we have to buy from them. If we order higher quantities they do not care. They do not care if we give them accurate quantities or not. They are not obligated to follow up with us or ensure the accuracy of these quantities.”

The Export Manager of Supplier E viewed Company E as a reliable customer for them who the relationship was based on honesty:

“...the relationship is based on honesty and you cannot lie. We have to be partners and we have to work together... (Company E) is a reliable customer for us.”

The following quote by the Senior Merchandiser reflected the typical view of the Company E interviewees about the type of relationship that connects them with suppliers:

“There must be confidence because it is a nominated supplier and the only one we are dealing with... Do you want the suppliers to save us? (Sarcastically); absolutely not.”

This later quote reflected that there was lack of confidence in the company's suppliers. It seemed that there was an expectation at Company E that the nominated suppliers exist for only performing the daily business transactions and not to become strategic partners.

Supplier Information Integration

- **Operational Information**

There was no real-time access or regular sharing of operational information between Company E and its suppliers. The Logistics Manager and Senior Merchandiser explained that operational information was transferred from suppliers only when requested. Company E recognised that the shared operational information needed regular follow ups in order to ensure its meaningfulness. The Senior Merchandiser explained her view:

“You need to follow up with them (suppliers). We are not their only one customer. If they give us two weeks lead time, after that during these 2 weeks I need to ask by myself about the current status of our orders.”

This quote explained that there was no regular sharing of operational information between Company E and its suppliers. Documents E-7, E-8, E-39, E-40, E-43 and E-44 contained operational information regarding delivery and stock levels shared through email. These documents explained that the final customers were involved in this communication and that the sharing of operational information between Company E and its suppliers was infrequent.

Both the company and its suppliers seemed to understand the importance of sharing operational information such as delivery information, production updates and order status for running the business smoothly. However, Company E shared infrequent operational information with its suppliers.

- **Strategic Information**

There did not seem to be significant strategic information sharing between Company E and its suppliers. The Merchandising Manager, Senior Merchandiser, and Export Manager of Supplier E explained that strategic information that Company E shared with its suppliers was limited to future order quantities every six months. The Export Manager of Supplier E explained that sharing of strategic information with Company E happens only when there is business for Customer E. Strategic information was transferred to suppliers not only by Company E but also from the customers who nominated these suppliers. The Logistics Manager explained that:

“...there must be sharing of information with suppliers. The customers we work with have specific suppliers. Hence, our customers send information to the nominated suppliers and we also send similar information from our side to the suppliers. So the suppliers receive the information from both entities.”

The Purchasing Manager of Customer E supported this view:

“These are suppliers who we nominated for (Company E). We get our fabric and trim suppliers involved in the development stage so that they know about the quantities and styles we are going to use for each order.”

The Logistics Manager and the Senior Merchandiser explained that transferring of this small amount of strategic information from both their company and the customers gave additional accuracy. The Export Manager of Supplier E explained that the strategic information received from Company E was meaningful and that his company understands that there are always order adjustments in the clothing industry:

“We can adjust numbers and figures in this industry. We always do not know 100% about what is going to happen tomorrow. We adjust and we always find compromises... if they (Company E) update us we check with our production to see what we can do if we can adjust the numbers and we work consequently.”

There was limited sharing of strategic information and in one direction from Company E to its suppliers. The significance of this information was affected by the direct contact that existed between the nominated suppliers and the final customers. This strategic information appeared to be meaningful although it was subject to being modified according to orders adjustments.

Supplier Material Integration

- **Standardised Procedures**

Company E did not have standardised procedures for managing material flow with its suppliers. The shipping issues such as the selection and performance assessment of carriers were not of interest to Company E and its suppliers. The Export Manager of Supplier E explained:

“They tell us who to use and we need to follow the instructions from (Company E)...in general we follow their instructions. We do not tell them with who they should work with.”

The Senior Merchandiser explained her understanding of material integration with suppliers:

“I send them (suppliers) an official purchase order and wait for the Performa Invoice from them. I then double check this invoice against the order I have placed in terms of quantity and quality. If it is the same product and the required quantity, then I send a signed purchase order.”

There appeared to be a lack of understanding as to the importance of closely managing inventory between Company E and its suppliers. The company did not have a real-time

access to stock levels and other material details with its suppliers. Documents E-8, E-39, E-40, E-44 and E-45 showed examples of email communication for arranging material shipping. The communication in these documents appeared to be prolonged and had delays in response.

Company E did appear to have standardised procedures for the management of material flow with its suppliers.

- **Close Coordination**

The company did not seem to have close coordination of material flow with its suppliers. The interviewees from Company E explained that there was no close coordination of managing material flow with suppliers including shipping issues. A typical explanation was provided by the Logistics Manager:

“We arrange the shipping company if the forwarder has a good service and price in the origin country...if it was Free-on-board (FOB) then I use my shipping company and they do not care. If the term is Cost and Freight (C&F) then it means that we are paying the freight cost. Sometimes we face problems that we ship with a global forwarder but this forwarder is not very good in Jordan...for me the important thing is to get products in house on time...the important thing for them is that we pay them for the cost of the materials.”

The Senior Merchandiser explained that there is usually limited coordination with suppliers and it is limited to shipping details:

“When the materials are ready I ask them to advise the weight and based on it we decide the shipping mode... they ask us to advise the shipping mode. After this I copy in the email our logistics department who decides accordingly.”

There did not seem to be recognition of the importance of closely coordinating the material flow based on common procedures and planning between Company E and its suppliers. The way material flow was organised with suppliers was limited to handing over materials to the forwarder.

Supplier Technological Integration

- **Information Sharing Systems**

There was no information sharing system for connecting Company E with its suppliers. Information was transferred either through meetings or communication tools. The company did not appear to appreciate the importance of having information sharing systems with its suppliers. However, the Senior Merchandiser explained that there is a technological connection between the company nominated suppliers and customers:

“...there is a technological link between the nominated suppliers and the customers. They can take information from the customers’ websites after it has been uploaded. The suppliers can take any information from the customer website. This reduces mistakes.”

The Merchandising Manager explained his view of not investing in a direct technological link with their suppliers:

“If the suppliers were not nominated then I would need to make sourcing from several companies after they offer me what products they have and what they do not have. But for the nominated suppliers...for example, a customer such as (Customer E) has nominated suppliers for all types of fabric and trim. So the nominated suppliers we are dealing with them have products that are limited and known for us and we cannot use alternatives for them.”

There was no information sharing system for connecting the company with its suppliers. However, these nominated suppliers were connected with the final customer through an EDI system.

- **Communication Tools**

All the communication between Company E and its suppliers was made through either emails or phone. The Logistics Manager explained that the company uses mainly emails for information sharing with its suppliers and the phone is rarely used. Documents E-39, E-40, E-43, E-44 and E-45 are examples of communication via email between Company E and its suppliers. These contained sharing of operational and strategic information where also customers were involved in the information shared. The Export Manager of Supplier E explained:

“Our connections with Company E are telephone and email. We do not have any conference calls or video conferences or so.”

Email and phone were the only communication tools Company E had with its suppliers for sharing both operational and strategic information with the email being the major tool.

External Customer Integration

Customer Actors Integration

- **Long-term Relationships**

Meetings were conducted between Company E and its customers intensively at the order development stage and follow up visits were made by the customers to Company E production facilities throughout the order fulfilment stage. The Merchandising

Manager explained that the relationship with customers is characterised by close contact and regular meetings:

“There are annual meetings. Also our General Manager visits (our customers) every two weeks. This is to strengthen the relationship, discuss the future orders and the current problems. We discuss any problems from their nominated suppliers. We discuss any logistics problems... We discuss with them the future quantities. Last meeting with one of our customers was last month and we discussed the future quantities... there is a supply chain between us and them. Every year they come and they do auditing and compliance procedures. They check if we are following the procedures and the code of conduct.”

The Purchasing Manager of Customer E explained that they have a quality representative based at Company E’s production facility to facilitate communication about quality. This was also explained by the Production Manager and the Quality Manager. The Operations Manager explained that the relationship with customers is built based on exchanging ideas and sites visits. The Logistics Manager explained:

“The customers have global offices so we deal with their buyer houses. We are in touch with them almost 24 hours a day... The customers’ merchandisers are in close contact with our merchandisers and we (Logistics Department) are in close contact with their logistics. So the connection with them (customers) is mainly through emails...they also visit us in here and we see each other...they do the inspection themselves here. Their technical people are in contact with their offices overseas. These update their offices with reports regularly about what is going on...they (customers) care about dealing with good manufacturers who have a high quality and good service.”

There seemed to be a close contact between Company E and its customers. The Company and its customers appeared to appreciate the importance of the relationship. However, there were few dedicated resources in the relationship that might explain the commitment. This was limited to customers’ quality specialists based at Company E production facility and an integrated EDI system with the major customers.

The Merchandising Manager and Senior Merchandiser explained that there might be more investments if the customers showed interest. The Operations Manager explained that the company would make better investments in the production facility if the customers showed willingness. The Logistics Manager explained that Company E had dealt with most of its customers for a long time and the relationship is expected to continue. The Quality Manager explained that their customers always make sacrifices for the benefit of the relationship.

It seemed that the mutual understanding between the company and its customers supports the commitment factor in the relationship. Although, most of the customers

have been dealing with Company E for many years now, the limited mutual investments in the relationship did not seem to encourage long term commitment. However, all the interviewees expected that the relationship will continue with customers as long as there is the ability to meet their expectations.

- **Mutual Understanding**

The Senior Merchandiser explained that there is mutual understanding with customers and these customers care about Company E's success. The Operations Manager explained that the company and its customers had honesty in the relationship and that there was sharing of advice between the two entities. The Quality Manager and Production Manager believed that Company E enjoyed a trusting relationship with its customers. The Merchandising Manager explained:

"They (customers) need vendors who they can count on them... we give them open costing and not closed costing. We give them everything with details so that they can check it."

The Logistics Manager explained:

"We work for them so we have mutual understanding with them. They are our customers and we need to believe them and say ok."

The Merchandising Manager explained:

"For example, they (customers) push us to reduce prices. Sometimes we help them in deliveries and we help them if they ask for anything that is urgent and we cannot do it but we try to help them. So there is partnership between us."

Mutual understanding appeared to be an important factor for Company E in building its long-term relationships with its customers.

Customer Information Integration

- **Operational Information**

Documents E-5, E-39, E-43, E-44 and E-45 showed intensive sharing of operational information with customers. Document E-37 showed a monthly production report which contained operational information shared with Company E's major customers. Documents E-36 showed a daily production reporting which its output was shared regularly with customers. The Operations Manager explained:

"When we start production we give them (customers) cutting and production information, output of daily production, where their orders are and other updates."

Most of this information was not shared on a real-time basis due to the lack of information sharing systems between the company and its customers. However, quality and technical information was available on a real-time basis to the customers' quality representatives who were based at Company E production facilities. Moreover, the company and its customers' respondents confirmed that operational information is transferred frequently which makes it to a good extent timely.

There seemed to be recognition by Company E and its customers to the importance of sharing operational information at different stages of the order fulfilment. The company shared a range of operational information with its customers on a daily and weekly basis such as order details, production information, shipping details and quality updates.

- **Strategic Information**

Company E shared strategic information related to future quantities with its customers every six months. The Logistics Manager explained:

“The Merchandising Department in our company has a contact with the Merchandising Department in the customer companies. They exchange information and agree about specific styles, the raw materials sourcing and prices. Then they start the procedures in terms of making the order, shipping, and the other procedures.”

The Senior Merchandiser explained that there was no regular sharing of strategic information with customers, but rather:

“...they (customers) share information about the next season's products which they are going to order. Which is going to be higher men's or women's wear, for example? They share such things so that we know about their market.”

The Purchasing Manager of Customer E explained:

“We meet every season with our vendors, we meet every 3-6 months and we discuss the future business... we do not give details but we give them general information so that we can ensure that they will have the sufficient capacity to take our orders.”

The quality of shared strategic information seemed to be affected by the order amendments by customers during the production stage. This resulted in lower production capacity utilisation at Company E. The Merchandising Manager explained:

“They (the production lines) are not at their full capacity; we have empty low season currently, for example. Changes in customers' projection happen frequently. Moreover, these projections are provided only three months in advance. So this is not a sufficient time to get prepared for the orders. However, so it is difficult to gain a new customer in short period of time... projections are projections so they are not always a 100% accurate. For example, if they decided that they will decrease their order, they should

give us a notice of at least 6-7 months so that we can gain a new customer and make the development with them.”

The sharing of strategic information between Company E and its customers seemed to be limited to order planning and generic projections for improved capacity planning. This happened at the beginning of each season every six months through meetings conducted between senior management of both entities.

Customer Material Integration

- **Standardised Procedures**

Company E had to work with forwarders nominated by their customers for the delivery of finished garments. The Purchasing Manager of Customer E explained that material is arranged with Company E based on standardised procedures:

“We (Customer E) have our own forwarders which we use with other vendors as well. Company E hands over the products on the agreed date to the forwarder and they ship it to us... They (Company E) usually show cooperation in this matter.”

Company E had to commit to the nominated forwarder by the customer. The Logistics Manager explained an experience with one customer:

“We had to ship once at our expenses because there was a delay from our side and we had to ship via air freight. But we refused to pay (The Nominated Forwarder) the huge amount they asked for. They asked us to use (The Nominated Forwarder) but it was too expensive.”

The company had relatively standardised procedures for managing material flow with its customers. The company did not have any inventory management initiatives with its customers.

- **Close Coordination**

There was no real-time access to production plans or stock levels between Company E and its customers. However, the company was able to regularly transfer material details and documents to its customers through the EDI systems and email. Document E-37 showed an example of a monthly production report which was sent regularly to customers. The Logistics Manager explained:

“They (customers) have nominated forwarders for both sea freight and air freight. They ask us to work with these nominated forwarders. We send the details of the shipments to the forwarders 10 days before shipping. This is through their websites which all customers have. Examples of information include destination, order number, style number, carton number, number of cartons, carton size and dispatch date.”

Company E did not seem to have a close management of material flow with its customers. However, the customers had identified procedures for arranging material flow with Company E including the details of shipping mode, the carrier and shipping routes.

Customer Technological Integration

- **Information Sharing Systems**

There was no dedicated information sharing system for connecting the company with its customers. However, Company E connected with its customers through web-based and integrated EDI systems. The Production Manager clarified:

“We use the customers’ websites to upload all documents and information they need about our production.”

Similarly the Merchandising Manager explained that Company E uses the EDI system for exchanging documents during order fulfilment stage:

“...they (customers) gave us a username and a password and we use this system and we download documents from this system.”

Document E-46 showed that Company E used the TradeStone application for exchanging data and documents with its customers during the order development and fulfilment. This application was seen as time efficient as it reduces the number of emails that would be sent. Another advantage that was reported for the use of TradeStone between Company E and its customers is that the customers were able to compare the costing information received from its different manufacturers.

The Senior Merchandiser explained importance of the EDI systems for connecting with customers and that emails are not enough:

“It (the EDI system) transfers all the style details and packing lists we give to them after been entered to this system via our Logistics Manager. Emails are not enough we need such a system to organise the process.”

Company E appeared to connect with its suppliers through an EDI system. However, there was no system that provided a real-time access to information.

- **Communication Tools**

Company E connected with its customers through emails, phone and video conferencing with the email being the major tool. Documents E-5, E-39, E-43, E-44 and E-45 showed the intensive information sharing through email with customers. The following quote by

the Merchandiser Manager provided a typical explanation of the communication tools in Company E:

“We have conference calls and emails. Most of our work is based on emails. We use phone as well.”

The Purchasing Manager of Customer E explained:

“We always use emails for our communication with (Company E) and the nominated suppliers... the website is useful to share documents and specific information but emails are useful for discussing and sharing daily operation and information.”

Emails followed by the EDI system appeared to be the main medium for information sharing between Company E and its customers.

5.5.5 Case Summary

Table 5.5 shown below provides a summary of how Company E integrated internally amongst the production and supporting functions and externally with its suppliers and customers.

		Actors	Information	Material	Technological
Supply Chain Integration - Case E	Internal Company Integration	Periodical weekly, monthly and annual meetings, pre-production meetings, informal daily meetings, problem solving and joint planning.	Regular sharing of operational and strategic information, no real-time access to information, relatively low quality information	Limited coordination of material flow, regular update of stock levels, and no real-time access to stock levels, problems with repeated orders.	No ERP, Internal shared folder through server, communication tools: email and phone
	External Supplier Integration	Nominated suppliers, no periodical meetings, no dedicated resources, trustful relationship and conditional commitment.	Infrequent sharing of operational and strategic information, no real-time access, to information high quality information	Coordination in handing over materials to the forwarder, no dedicated resources, no inventory initiatives, no real-time access to stock levels	Communication tools: email and phone
	External Customer Integration	Infrequent meetings, site visits, dedicated customer service, mutual understanding, on-site based quality representatives.	Regular sharing of operational and strategic information, no real-time access, low quality information	Identified procedures from customers, nominated forwarders, no inventory management initiatives, no dedicated resources	Web-based EDI, integrated EDI, communication tools: email, phone and conference calls

Table 5.5: A summary of integration across Supply Chain E

Although there appeared to be an understanding as to internal actors integration, the lack of an internal information sharing system affected the level of quality of information shared. Supplier integration appeared not to be of the interest to Company E. Customers integration was more obvious than the internal and suppliers integration.

5.6 Chapter Summary

This chapter reported case-by-case analysis. The chapter started by providing a background to the companies involved in the case study research. The three tiers of the

supply chain of the focal company, supplier and customer were discussed. None of the five focal companies produced raw materials and all fabric and trim were sourced from international suppliers. Most of the manufacturers' productions were limited to cut and make operations. A summary of the fundamental information from each company was grouped and put together in Table 5.6 below. This table also gives a clearer picture to understand the positions of the participating companies in their supply chains.

		Business Activity	Relationship Duration	Number of Employees	Year Founded	Location
Case Study A	Company A	Manufacturer of men's and women's wear	Long with most suppliers and customers	1100	1992	Jordan
	Supplier A	Producer of fabric	5 years (with the focal company)	1650	1973	Turkey
	Customer A	Customer of women's wear	5 years (with the focal company)	320	1996	Turkey
		Business Activity	Relationship Duration	Number of Employees	Year Founded	Location
Case Study B	Company B	Manufacturer of men, women and kids' wear	Relatively long with suppliers and customers	1200	2006	Jordan
	Supplier B	Producer of fabric	9 years (with the focal company)	600	1997	China
	Customer B	Customer of women's wear	9 years (with the focal company)	50,000	1965	USA
		Business Activity	Relationship Duration	Number of Employees	Year Founded	Location
Case Study C	Company C	Manufacturer of men's wear	Long with suppliers and customers	320	1949	Jordan
	Supplier C	Agent of fabric and trim	7 years (with the focal company)	100	1994	Turkey
	Customer C1	Retailer of men's wear	6 years (with the focal company)	6	2003	Qatar
	Customer C2	Retailer of men's wear	31 years (with the focal company)	12	1976	Dubai
		Business Activity	Relationship Duration	Number of Employees	Year Founded	Location
Case Study D	Company D	Manufacturer of men and women's wear	Relatively long with suppliers and customers	9000	2003	Jordan
	Supplier D1	Producer of trim	9 years (with the focal company)	700	1987	Dubai
	Supplier D2	Producer of knitted fabric	6 years (with the focal company)	200	2001	China
	Customer D	Customer of women's wear	9 years (with the focal company)	50,000	1965	USA
		Business Activity	Relationship Duration	Number of Employees	Year Founded	Location
Case Study E	Company E	Manufacturer of men and women's wear	Short with suppliers and customers	1300	2004	Jordan
	Supplier E	Producer of fabric and trim	6 years (with the focal company)	3500	1836	Italy
	Customer E	Customer of men and women's wear	10 years (with the focal company)	100	1998	Turkey

Table 5.6: A summary of the basic information of the participating companies

This chapter has also undertaken an individual analysis for each case study. The supply chain integration main themes of internal company integration, external supplier integration and external customer integration, together with their lower level constructs were used to discuss the data collected from the five case studies. Table 5.7 shown below provides a summary of supply chain integration analysis by the individual case studies.

		Actors	Information	Material	Technological
Case Study A	Internal Company Integration	Cross-functional teams, joint planning and shared goals	Full access and high quality (high visibility)	Close coordination and highly standardised procedures	ERP, email, shared folder and phone
	External Supplier Integration	Limited relationship and limited mutual understanding	Infrequent sharing (limited visibility)	Limited coordination and relatively standardised procedures	Email, phone, conference calls and fax
	External Customer Integration	Close relationship and mutual understanding	Regular sharing and high quality (relatively high visibility)	Relatively close coordination and highly standardised procedures	EDI, email, phone, conference call and fax
		Actors	Information	Material	Technological
Case Study B	Internal Company Integration	Joint planning and shared goals	Full access and high quality (high visibility)	Close coordination and standardised procedures	ERP, email, shared folder and phone
	External Supplier Integration	Limited relationship and limited mutual understanding	Infrequent sharing (limited visibility)	Limited coordination and limited standardised procedures	Email, phone, conference calls and fax
	External Customer Integration	Close relationship and mutual understanding	Regular sharing and high quality (relatively high visibility)	Relatively close coordination and standardised procedures	EDI, email, phone, conference calls and fax
		Actors	Information	Material	Technological
Case Study C	Internal Company Integration	Cross-functional teams, joint planning and shared goals	Full access and relatively low quality (limited visibility)	Relatively limited coordination and standardised procedures	ERP, email and phone
	External Supplier Integration	Limited relationship and relatively limited mutual understanding	Infrequent sharing and low quality (no visibility)	Limited coordination and standardisation of procedures	Email, phone and fax
	External Customer Integration	Relatively limited relationship and mutual understanding	Infrequent sharing and relatively low quality (limited visibility)	Limited coordination and standardised procedures	Email, phone and fax
		Actors	Information	Material	Technological
Case Study D	Internal Company Integration	Cross-functional teams, joint planning and shared goals	Full access and high quality (high visibility)	Close coordination and relatively standardised procedures	ERP, email and phone
	External Supplier Integration	Limited relationship and relatively limited mutual understanding	Infrequent sharing (limited visibility)	Limited coordination and relatively standardised procedures	Email, phone and conference call
	External Customer Integration	Close relationship and mutual understanding	Regular sharing and high quality (high visibility)	Close coordination and standardised procedures	EDI, email, phone and conference call
		Actors	Information	Material	Technological
Case Study E	Internal Company Integration	Cross-functional teams, joint planning and shared goals	Regular sharing and low quality (relatively limited visibility)	Limited coordination and standardised procedures	Email, shared folder and phone
	External Supplier Integration	Limited relationship and limited mutual understanding	Infrequent sharing (limited visibility)	Limited coordination and standardisation of procedures	Email and phone
	External Customer Integration	Relatively close relationship and mutual understanding	Regular sharing and relatively low quality (limited visibility)	Relatively close coordination and standardised procedures	EDI, email, phone and conference call

Table 5.7: A summary of supply chain integration analysis by the individual case studies

The table above shows that most focal companies appreciated the importance of internal company integration through focusing on having the needed internal structure for achieving actors, information, material and technological integration. Similarly, most focal companies appeared to have close relationships and smooth flow of information and material that would facilitate achieving external customer integration. On the contrary, the focal companies did not appear to have achieved external supplier integration. The focal companies did not appear to have invested heavily in their relationships with suppliers and customers in terms of dedicated physical resources that would explain outstanding partnerships. Hence, this chapter highlights the following main emerging trends from the individual analysis of the cases:

- Most focal companies focused on having the needed structure for internal company integration.
- Most focal companies appeared to have close relationships with their customers. However, these companies did not appear to have invested heavily in their relationships through highly dedicated and customised resources. However, there seems to be some evidence of human investments.
- Most focal companies appeared to have limited interaction with their suppliers. There did not also seem to be dedicated resources in the relationships with suppliers.
- There was a frequent use of the term ‘nominated suppliers’ in the individual case studies.

However, the analysis in this chapter did not allow the interrelationships between the levels of supplier, customer and internal integration in each case study to be understood. Furthermore, the purpose of this chapter was to analyse the case studies individually which did not allow the main themes to emerge. This issue is dealt with in the next chapter where the five case studies will be compared and contrasted at a more abstract level in order to develop themes from the case study research and make empirical generalisations from these themes.

6. Findings from Analysis across Case Study Supply Chains

The cross-case analysis compares and contrasts the different data across the different case studies (Voss *et al.*, 2002). This process allows the researcher to go beyond the initial interpretations of each case and capture findings from the data (Eisenhardt, 1989). This chapter introduces an interpretation to the key themes identified in the five case studies in the previous chapter. The theoretical supply chain integration framework encompassed three levels of internal company integration, external supplier integration and external customer integration. These levels of integration were used for analysing the individual case studies and will be also used in this chapter to inductively identify empirical generalisations. Each level is explained in terms of its main components of actors' integration, information integration, material integration and technological integration and the lower level constructs will be embedded in these main components of integration. Through applying the logic of data replication across the five case studies, this chapter aims to introduce an in-depth interpretation of the findings of integration across international garment manufacturers supply chains.

This chapter will draw on RBV to interpret the findings from the cross-case analysis. Barratt and Oke (2007) introduced a useful contribution which benefited from the RBV rationale to understand achieving competitive advantage in supply chain information linkages. Their proposition was that competitive advantage can be achieved through sharing high quality information between organisations (Barratt and Oke, 2007) and amongst the internal production and supporting functions (Barratt and Barratt, 2012). This thesis extended the argument and proposed that competitive advantage can be achieved through the resources that provide capabilities as a result of internal company integration, external supplier integration and external customer integration. Therefore, a detailed analysis was conducted to explore the role of these main three themes in providing the capabilities of potentially producing a competitive advantage across the five case studies. This means that the resources that hold the potential for achieving a competitive advantage could be found in the way material integration and actors' integration were developed as well as information sharing and its enabling technologies. Hence, this chapter develops empirical generalisations through comparing and contrasting the emerging themes across the individual cases studies, and applies the RBV characteristics to evaluate attaining a competitive advantage across the findings.

6.1 Internal Company Integration

6.1.1 Internal Actors Integration

Company A, C, D and E conducted informal daily and scheduled weekly meetings amongst the production and supporting functions and company-wide annual meetings. This resulted in higher interaction and enabled internal joint-planning and sharing of goals. However, the situation was different at Company B in that there were no scheduled weekly meetings and they were arranged when needed almost twice a month. However, the lack of scheduled meetings did not seem to result in any visible impact as the company maintained a high level of interaction and the collaborative culture was observed. The weekly meetings at Company A, C, D and E and the semi-monthly meetings at Company B would typically involve the discussion of the operational issues such as productivity, production status, delivery performance and quality issues and sharing of operational ideas and knowledge by the participating production and supporting functions' personnel. Company A, C and D drafted and distributed the outcomes of the weekly meetings to the relevant departments in order to ensure the agendas discussed were followed up. The Company C's Quality Manager played the role of orchestrator for conducting, drafting and chairing the departmental weekly and annual meetings. This appeared to be useful in that there was a higher clarity of the agendas that were discussed and a dedicated follow up. Despite conducting periodical weekly meetings and shared goals amongst the production and supporting functions, Company C suffered from disruptions in production operations seen in the underutilised production resources and excess stock. Therefore, the effectiveness of joint-planning during these periodical meetings is questioned although it was supported by daily interaction. The reason for this seemed to be related to the lack of regular information sharing with customers and the understanding of their requirements.

Company A, B, D and E dealt with each customer's order as a separate project; therefore, these four focal companies conducted a pre-production meeting upon receiving a new order. The pre-production meetings at Company A, B, D and E would typically involve the planning of production capacity such as production lines and manpower, logistics resources such as the space in the warehouse and the human resources, and the lead time of sourcing, production and delivery. These pre-production meetings were essential for capacity planning which resulted in higher efficiency in internal operations seen in the full utilisation of production lines and reduced stock levels, and better management of customers' requirements seen in meeting their

capacity requirements. However, the impact was less apparent in Company E. Moreover, Company A and B conducted further pre-production meetings when there were amendments to customers' orders. Company C did not have pre-production meetings as it stocked fabric and trim, and had smaller and more frequent orders unlike the situation at the other four focal companies who dealt with each customer's order as a separate project. This did not seem to directly affect the level of internal actors' integration in Company C as there were scheduled periodical weekly and informal daily meetings amongst the production and supporting functions who discussed the production operations, customer's orders and the promotional plans.

The informal daily meetings at the five focal companies involved sharing operational information such as delivery updates and production status. This was necessary for the smoothness of the production operations and reducing disruptions. Such informal interaction appeared to produce company's own relationship style and develop some social complexity. Moreover, Company A conducted daily ad-hoc meetings to discuss the quality issues and deal with any quality concerns arising. This helped produce high quality garments which resulted in high customers' satisfaction seen in the type of customers being high fashion brands known for their high quality products. There were also quarterly meetings which involved senior management and a group of first-line workers from the production and supporting functions. This was seen as useful to obtain feedback from the workers such as the operational reasons for quality failure and material shrinkage. Company D also had monthly meetings which also involved senior management and included the sharing of ideas and the discussion of the running projects. The frequent sharing of knowledge and the social relationships at Company D were seen as useful to enable problem solving and create a collaborative culture. The annual meetings at Companies A, B, C, D and E discussed strategic plans at the departmental and company level. This included setting annual functional goals where every department would present its plans and goals for the following year. However, this was most evident in Company A, C and D. Conducting the periodical meetings and pre-production meetings was essential to achieve joint planning and problem solving at Companies A, B, D and E, but Company C performed this through only periodical meetings.

The five focal companies had support from senior management to increase collaboration through joint-planning and sharing goals amongst the production and supporting functions although this was less evident in Company E. Although Company E

conducted periodical weekly meetings and monthly meetings for discussing the production and shipping performance, that senior management rejected installing internal information sharing system restrained the internal information visibility. It was also observed that Company E had a frequent turnover of employees which appeared to impact on developing a company's unique procedures and work environment. Company A's employees reported higher job satisfaction and work stability as most of the senior management and employees had been working for this company for more than twenty years. This seemed to impact on the level of internal relationships and the accumulation of knowledge through developing experiences and work routines. Company A was different from the other four focal companies in that it employed job-rotation amongst the production and supporting functions which was considered by the interviewees to be useful for understanding the work of other departments. Although Company C had been in business for more than fifty years, the company had frequent changes in its senior management which did not seem to support creating a highly embedded relationship. Company B and D were able to maintain a stable work environment through support from senior management and informal arrangements of activities and daily interaction. This appeared to be useful to increase the interaction amongst the different functions and increase the flexibility which was observed during site visits and seen in the easiness of communication.

In summary, the five focal companies were similar in that their production and supporting functions worked closely through periodical meetings, joint-planning and shared goals. This allowed continuous problem solving of operations which seemed to impact on the smoothness of production activities seen in the improved capacity planning although this was less evident in two of the companies. The effectiveness of the weekly meetings at one of these two companies was questionable and the lack of great performance improvements in the other company seemed to be related to the lack of information integration. This means that the internal formal structure in itself did not facilitate producing higher integration and it needs to be supported with effective actors meeting, planning and higher information sharing. There were similarities between four of the companies in that they managed their customers' orders as a project activity with pre-production meetings amongst the production and supporting functions after winning a customer order. Most of the joint-planning happened during these meetings which was necessary for allocation of production and logistics resources. This resulted in higher efficiencies seen in the full utilisation of production and logistics resources and reduced

disruption in production operations. The sharing of goals happened only during the annual meetings at three of the companies which involved all the business functions. This sharing of goals was necessary for the different functions to understand the work of the other departments as well as the overall goals of the company over the next period of time. The collaborative culture was observed in all focal companies where there was higher interaction and involvement of the different departments. Table 6.1 below summarises the findings from internal actors' integration generalisations across the five cases.

Internal Company Integration	Actors
	Generally, internal actors' integration was evident in all focal companies through regular interaction, sharing of goals and understanding the work of other departments. The impact of this was smoothed production operations, improved visibility and capacity planning in most cases. However, the effectiveness of actors' integration appeared to impact on the gains from this level of integration. But, the formal internal structures in themselves did not facilitate producing higher integration.

Table 6.1: Findings from across internal actors' integration generalisations

Applying the 'RBV VRIN' characteristics, it is argued that the resource created as a result of internal actors' integration was valuable at Companies A, B and D in that it increased the efficiency seen in the reduced disruption in production operations and smoothed production. However, the value produced at Company C and E was lower seen in the role of the cross-functional teams in facilitating problem solving and following up business operations. The value was low at Company C as the company appeared to have the needed structure to have internal actors' integration but the contents were not communicated with customers. This resource was seen as rare in Company A, B and D in that there were high level of interaction through cross-functional teams and joint-planning and shared goals which created a great value seen in the improved capacity planning, productivity and quality. However, this resource was not seen as rare in Company C and E as there was nothing special about the way it was developed in these three focal companies. It is argued that other clothing manufacturers could develop similar resources that are based on cross-functional teams, shared goals and joint planning. Hence, it is also argued that the resource created as a result of internal actors' integration in Companies C and E had a limited potential for generating a sustainable competitive advantage. However, the resource created in Company A, B and D as a result of internal actors' integration had a potential for achieving a

competitive advantage. Table 6.2 below summarises the VRIN evidence from the findings in the internal actors' integration.

Internal Company Integration	Actors	
	V	The internal actors' integration created a valuable resource in all cases. However, the value was greater when there was a higher interaction and understanding of the work of the other departments. Having the formal structure of internal actors' integration was not seen as sufficient to produce great value as the customer integration seemed to be also relevant.
	R	The internal actors' integration appeared to create a rare resource in the majority of cases as there appeared to be an embedded relationship developed to the mutual benefits of the actors. However, when this resource did not appear to be rare, there were limited resources that appeared to interact with other internal business functions.
	I	The internal actors' integration appeared to create an inimitable resource in most cases. This inimitability appeared to develop from the embedded relationship that created an internal collaborative culture with a defined common purpose which was characterised by employee involvement and high job satisfaction. This management style created a social workplace complexity that could not be perfectly imitated. When this resource was seen as imitable, it appeared that the formal arrangements of meetings and joint-planning did not create a difficult to replicate resource when it was not embedded in a unique company culture.
	N	When there was no resource that would replace the common beliefs that was created within the company, the internal actors' integration resource was found to be non-substitutable. However, this resource was substitutable in some cases in the sense that it was neither rare nor inimitable as the formal arrangements appeared to be as functions that would be fulfilled by similar arrangements.
	VRIN	Internal actors' integration appeared to contribute to competitive advantage through higher interaction, embedded relationships and collaborative culture.

Table 6.2: The relevance of the RBV-VRIN to the internal actors' integration across the cases

6.1.2 Internal Information Integration

The sharing of strategic information such as forecasts and opportunities for potential new markets happened during the weekly and annual meetings in the five focal companies. Companies A, B, D and E were similar in that most of the order-related information such as production capacity was shared during the pre-production meeting which was conducted prior to starting the production process for a new order. This was useful for the production capacity planning which improved the level of productivity seen in the full utilisation of the available resources such as production lines and manpower. However, this was less evident in Company E. The low quality of strategic information shared by Company E's customers seemed to impact on the quality of internal strategic information which resulted in poor capacity planning at Company E. Company C was different in that it shared most of the internal strategic information such as forecast and promotional plans during the annual meeting and, less often the weekly meeting. The lack of sharing formal and accurate forecast-related information by Company C's customers and depending on historical forecast appeared to produce

inaccurate and lower quality internal strategic information. The impact of this appeared to be inefficiency in production operations at Company C seen in the underutilised production lines. Another reason appeared to be related to the lack of effective communication between the Merchandising and Production Functions.

The five focal companies appeared to share significant operational information such as stock levels, production reports and order details amongst the production and supporting functions. The sharing of operational information was essential to improve the planning of logistics resources and sourcing of materials from suppliers and delivery to customers at the five focal companies. The way operational information shared was, to a large extent similar in the five focal companies in that it was through informal daily interaction, email, ERP system and shared folder, however; Company E did not have an ERP or any other internal information sharing system. The use of ERP systems in Company A, B, and D appeared to facilitate the sharing of high quality information through the real-time access to information and higher accuracy. Moreover, the interviews at the five focal companies suggested that most heads of production and supporting functions used their own experiences to ensure the quality of information they received. Another procedure for ensuring the quality of information was the documentation of shared information which was followed in Company A, B, C and D and contributed to improve the timeliness and accuracy of information at Company A, B and D. This resulted in intensified sharing of information amongst the production and supporting functions which seemed to impact on the smoothness of production operations and material flow. This appeared to improve productivity, reduce raw material stock and work-in-progress although the impact was less evident in Company C and E. The lack of internal information sharing system in Company E produced inaccuracies in the shared operational information such as the stock levels and reduced effectiveness seen in the frequent preparing and sharing of daily and weekly reports through spreadsheets.

In summary, the five focal companies shared information amongst the production and supporting functions intensively. The sharing of high quality information at three of the companies seemed to be essential to improve the internal visibility. The result was to improve the planning of production capacity, logistics resources and reduced disruptions in production operations and the low level of raw material stock and work-in-progress. The quality of shared internal information appeared to be affected by the quality of strategic information shared by customers seen in the other two companies

where there was inaccuracy of the shared strategic customer information. For instance, the lack of information quality produced poor capacity planning and frequent shortage of fabric and holding excess fabric in stock. Sharing low quality information resulted in an inefficient production capacity planning process and difficulty in dealing with repeated customers' orders as a result of the low quality of shared stock levels. Table 6.3 below summarises the findings from internal information integration generalisations across the five cases.

Internal Company Integration	Information
	Generally, the sharing of high quality information produced higher internal visibility seen in the smoothed production and material flow. However, the benefit of internal information integration was greater when customer information integration existed. The sharing of low quality information resulted in poor capacity planning and inefficient stock control.

Table 6.3: Findings from across internal information integration generalisations

Using the 'RBV VRIN' characteristics, it is argued that the full access to information by the production and supporting functions at Company A, B, and D created a valuable resource seen in the improved visibility, planning of logistics resources and responsiveness. However, the value was lower for Company C and E where there was low information quality. Although this resource created some value at Company C and E, it was not seen as rare at these two companies as the impact was not significant. Therefore, it is said that the potential for this resource to achieve a competitive advantage in Company C and E was limited. On the contrary, this resource was seen as rare in Company A, B and D as it provided high visibility and it was also seen as inimitable and non-substitutable. Hence, the visibility achieved as a result of internal information integration in this resource at Company A, B and D through sharing full information amongst the production and supporting functions was seen as distinctive and therefore, there is a potential for achieving a sustainable competitive advantage. Table 6.4 below summarises the VRIN evidence from the findings in the internal information integration.

Internal Company Integration	Information	
	V	The internal information integration created a valuable resource in all cases. However, the value was greater when there was higher quality information.
	R	There appeared to be limited evidence of the rareness of this resource as the sharing of information was not of high quality at some cases and therefore the visibility produced was limited. Where this resource was found to be rare there appeared to be full sharing of high quality information and higher interaction amongst the production and supporting functions.
	I	This resource was found to be inimitable in most cases. Where this resource was found to be inimitable there appeared to be high internal visibility supported with an embedded internal relationship.
	N	This resource was seen as non-substitutable in most cases. The distinctive visibility produced as a result of the full sharing of high quality information and informal interaction appeared not to be substitutable with any other resource.
	VRIN	Internal information integration contributed to competitive advantage through sharing high quality information, higher interaction and embedded relationship.

Table 6.4: The relevance of the RBV-VRIN to the internal information integration across the cases

6.1.3 Internal Material Integration

Companies A, B, D and E were similar in that they sourced raw material only after winning a customer order and making sourcing arrangements with the nominated suppliers. Company B, D and E kept a small percentage of approximately five percent of fabric and trim as a buffer stock for any possible quality failure. However, Company A kept a three-month of stock for its Far Eastern suppliers and less stock for its geographically closer European suppliers where the transit-time was shorter. This resulted in improved efficiency seen in the reduced stock levels of raw materials including fabric and trim. Company C was different from Company A, B, D and E in that raw materials were stocked in anticipation of future demand. However, Company C suffered from excess and obsolete fabric and trim stock because of demand uncertainty. Moreover, the company adopted a make-to-stock strategy for its branded label garment which resulted in excess inventory at the end of season. Company A, B, C and D were similar in that material was stored in the warehouse after being received from suppliers and its details such as quantity, style, date received and the supplier's details were entered into an ERP system which was accessible by the production and supporting functions on a real-time basis. However, although Company E did not have an ERP system, material details were entered into a spreadsheet which was distributed on a daily basis via email to the production and supporting functions by the Information Technology (IT) Department's personnel. This allowed the material flow at the five focal companies to be monitored by the different functions. However, Company E suffered from inaccuracy in the shared stock levels and difficulty in dealing with repeated customers' orders. Furthermore, the frequent sharing of stock levels through

spreadsheets at Company E was inefficient due to the large volume of materials and number of stock-keeping-units (SKUs) managed internally.

Company A, B, C, D and E had identified procedures for managing internal material as it arrives, such as when to call material from the warehouse, how much work-in-progress to keep per production line and the customer order despatch procedures. This was most apparent in Company A, B and D where the procedures were clearly identified and followed throughout the internal operations. This resulted in smoothed production seen in the reduced levels of work-in-progress (WIP) and the full utilisation of production resources, although these benefits were less evident at Company C and E. The production and supporting functions in all cases coordinated internal material flow closely and communicated with each other regularly on a daily basis. The internal actors' integration through departmental meetings and the regular interaction appeared to facilitate this coordination. At Company B, the production and supporting functions would share any issues that would impact on the accuracy of the stock levels such as the accuracy of quantities held in stock and the accurate calculations for the materials that need to be sourced. At Company A and D, the production and supporting functions discussed the work-in-progress and the available raw materials during the daily ad-hoc meetings. Through the involvement of first-line workers in reporting any shrinkage in material, Company A was able to maintain a good level of stock control. Moreover, the production and supporting functions at Company A were able to develop a system through which the ordering of fabric from the warehouse was based on finding the best way for reducing the number of fabric rolls which resulted in reduced fabric stock. At Company C, there was frequent coordination amongst the production and supporting functions about the flow of raw material and WIP. Nonetheless, Company C had a disruption in production operations seen in the low utilisation of production lines and holding excess finished garments inventory and out-of-fashion fabric. However, this appeared to be related to the low external integration with customers and suppliers which seemed to impact on achieving internal material integration. At Company E, the work-in-progress and the needed materials details were discussed through the monthly meetings and reports and the informal daily interaction.

In summary, there appeared to be close coordination and standardised procedures for managing internal material flow in most cases. This appeared to smooth the production operations and reduce work-in-progress stock. Moreover, the regular interaction and close coordination appeared to create a learning expertise and knowledge in managing

internal material flow and increase the efficiency through the standardisation of procedures. The ERP system was seen as a key tool for facilitating the management of internal material at three of the companies. It was not seen as efficient to share production and stock reports on a daily basis through spreadsheets. Although there was access to material details through an ERP system and daily interaction at one company, it had excess fabric and finished garments held in stock and a frequent shortage of fabric. This appeared to be related to the effectiveness of the internal communication and the lack of external integration with suppliers and customers. Table 6.5 below summarises the findings from internal material integration generalisations across the five cases.

Internal Company Integration	Material
	Generally, internal material integration was evident in most cases. The impact was smoothed production operations and reduced inventory in stock. However, the impact was minimised in the absence of external customer integration and supplier integration. Sharing material details through only spreadsheets and the lack of ERP produced inaccuracy of stock levels and inability to deal with repeated customers' orders.

Table 6.5: Findings from across internal material integration generalisations

According to the RBV VRIN characteristics, it is argued that Company A, B and D managed internal material flow efficiently which provided a valuable resource seen in minimising the inventory held in stock and reduced disruption in production operations. However, the value created in Company C and E was lower. The internal material integration was seen as a rare resource in Company A, B and D as there was close coordination, involvement of employees and embedded relationship. This resource was also seen as inimitable in these three companies as the skill set of the employees involved in the material flow process created a social complexity which seemed to make this resource more difficult to replicate. Hence, this resource is said to be non-substitutable as it appeared to be supported with the involvement of highly knowledgeable and committed employees which is unlikely to be substituted with another resource that would produce a sustainable competitive advantage. This resource, therefore, appeared to have the potential for achieving a competitive advantage in Company A, B and D. However, it is argued that other garment manufacturers could develop a similar resource to that created in Company C and E through efficient internal material integration. Although this resource contributed to the improvement of the operational performance in Company C and E, it is argued that the potential for this

resource to provide a competitive advantage was limited. Table 6.6 below summarises the VRIN evidence from the findings in the internal material integration.

Internal Company Integration	Material	
	V	A valuable resource was created in all cases as a result of sharing full material details, and identified procedures. The value was greater when there was customer material integration. However, the value was lower where there was no real-time access to material details and low quality of information shared by customers.
	R	This resource was seen as rare in most cases. The rareness of this resource was more evident when there was close coordination that was characterised by the involvement of employees and embedded relationship.
	I	This resource was seen as inimitable when the internal material integration was supported with a social complexity. Moreover, the skill set of the employees involved in the material flow process appeared to make this resource more difficult to replicate.
	N	This resource was seen as non-substitutable in most cases. When internal material integration appeared to be supported with the involvement of highly knowledgeable and committed employees, it appeared to create a history-dependent resource. This resource seemed to be unlikely to be substituted with another resource that would produce a sustainable competitive advantage.
	VRIN	Internal material integration contributed to competitive advantage through real-time access to material details, the standardisation of procedures, common beliefs, embedded relationship and improved customer material integration.

Table 6.6: The relevance of the RBV-VRIN to the internal material integration across the cases

6.1.4 Internal Technological Integration

Company A, B, C and D used an ERP system, email and shared folder as a technology for information sharing amongst the production and supporting functions. The use of an ERP system enabled a real-time access to operational information such as material details, stock levels, production status and customer orders which seemed to produce higher information quality and visibility. This was seen in the improved operational effectiveness such as the smoothed flow of material and reduced disruption between production stages although this was not highly evident in Company C as the information entered did not appear to be of high quality. Only Company E did not invest in any information sharing system and depended only on email and shared folder as a technology for information sharing amongst the different functions. The company's senior management did not consider that investing in an internal information sharing system would make significant improvements comparing to the high value of investment. The impact of this was lower accuracy and timeliness of the information transferred amongst the production and supporting functions which appeared to create a lower visibility. For example, the company was not able to find out about the accurate stock levels of fabric and trim when it received a repeated order from customers which resulted in discrepancies of the quantities held in stock. Moreover, the lack of an ERP system resulted in reduced efficiency seen in the frequent transfer of production and inventory reports by the IT personnel.

The ERP system was managed and controlled by the IT personnel at Company A, C and D. However, Company B had a designated ERP Manager (LOGIC Manager) who was responsible for ensuring the accuracy of the information before being uploaded into the ERP system which supported sharing accurate information. The ERP Manager conducted regular training of the production and supporting functions personnel on how to use the system effectively and to explain its features. This appeared to impact the high quality of shared information observed in Company B. Email was a major medium of communication and information sharing amongst the production and supporting functions in the five focal companies. The email on its own did not seem to make high impact however, when it was used along with the ERP system in Company A, B, C and D it seemed to support the sharing of higher quality and visibility of information. Nevertheless, the impact of this visibility on material integration and production operations was not evident in Company C. On the contrary, Company E reported lower efficiency and limited visibility amongst the production and supporting functions. Although email created low information visibility among the production and supporting functions at Company E, it facilitated the sharing of information that supported internal operations.

In summary, the production and supporting functions in most companies appeared to be technologically integrated through the use of an ERP system, email and shared folder for information sharing. The use of an ERP system appeared to contribute to producing high quality information and improve the visibility amongst the production and supporting functions. However, it was observed that the ERP in itself did not produce a high impact on internal material and information integration as it needed to be supported by effective internal company integration. One company was different in that it did not use an ERP system and similar to the other focal companies in that it used email and shared folder for information sharing amongst the production and supporting functions. However, email and shared folder were not sufficient to handle the intensive sharing of information such as the details of the large number of stock-keeping-units (SKUs) and production reports which resulted in information inaccuracy. Table 6.7 below summarises the findings from internal technological integration generalisations across the five cases.

Internal Company Integration	Technological
	Internal technological integration was evident in most cases. Generally, ERP was essential for facilitating the full access to information. However, it was found that the ERP in itself did not produce high impact on internal material and information integration as it needed to be supported by effective internal company integration. The lack of ERP in one case created low visibility which appeared to restrict producing high information integration and material integration.

Table 6.7: Findings from across internal technological integration generalisations

Using the RBV VRIN characteristics, the real-time access to information through the ERP system created a resource that provided value to Company A, B, C and D through improved visibility and smoothed operations. However, the value provided in Company C was low as the quality of information entered was not of high quality. Although the sharing of information through email at Company E produced lower visibility, there was a little value produced as a result of using the email seen in facilitating the sharing of operational information that supported the internal operations. Although the use of ERP was not seen as a rare resource, when these technologies were supported with an internal embedded relationship and customer information integration, it appeared to produce rare resources at Company A, B and D. The high quality information shared through the ERP and the social complexity that was created as a result of the embedded relationship appeared to make this resource as inimitable. This resource therefore, is said to be non-substitutable in Company A, B and D as internal technological integration allowed a real-time access to high quality information and facilitated material and information integration. It does not appear to be possible for any other resource to substitute the visibility created as a result of internal technological integration. For example, it was not possible for Company E to create high internal visibility without an internal information sharing system. However, although it is likely to replace the internal technological integration resource by other companies, the value of information shared and highly committed workforce and high quality of input seemed to be not easy to substitute with a resource that is able to produce a competitive advantage. Therefore, it is argued that the resource created as a result of internal technological integration had a potential for producing a competitive advantage in Company A, B and D. Table 6.8 below summarises the VRIN evidence from the findings in the internal technological integration.

Internal Company Integration	Technological	
	V	A valuable resource was created in all cases. However, the value was greater when there was internal information system that offered a real-time access to information.
	R	Internal technological integration created a rare resource in most cases. Although the use of internal information sharing systems and communication tools in themselves were not seen as rare resources, when these technologies were supported with embedded relationships and customer information integration, it appeared to produce rare resources.
	I	This resource was seen as inimitable in most cases where having internal information sharing system that offered real-time information was supported by high quality information. When the technological integration was found to interact with the company embedded relationship it appeared to develop a social complexity that created a difficult to copy resource.
	N	This resource was seen as non-substitutable where there was a real-time access to high quality information and the availability of internal technology facilitated material and information integration.
	VRIN	Internal technological integration contributed to competitive advantage through internal information system that was supported with high quality information and combined with a company collaborative culture.

Table 6.8: The relevance of the RBV-VRIN to the internal technological integration across the cases

6.2 External Supplier Integration

6.2.1 Supplier Actors Integration

None of the five focal companies considered that their suppliers would be strategic partners. For Companies A, B, D and E, suppliers were nominated by customers. These four companies had to adhere to sourcing instructions from their customers for fabric and trim and from which suppliers. Therefore, the relationship appeared to be limited to performing the day-to-day business transactions with most of these four companies' suppliers. Company C was different in that it was a full-package manufacturer and did not have any nominated suppliers by customers. However, the relationship that Company C had with its suppliers did not appear to be much different from the relationship that Companies A, B, D and E had with their suppliers in that it was not seen as strategic. None of the five focal companies had any dedicated resources in the relationship with their suppliers however, Company D had a sourcing office in proximity of the major suppliers in China and managed its relationships relatively more closely than the other four focal companies. Company D was different from Company A, B, C and E in that it had a dedicated customer service team by some of their suppliers. The impact of this was close contact and improved service level, although having a dedicated customer service based in Jordan by suppliers did not add any value to the relationship. There were infrequent mutual visits between the five focal companies and their suppliers. Company A, B, D and E had infrequent visits every almost 6-12 months when there was a visit to the Middle East or Jordan by these suppliers and the visits were not usually dedicated for the focal company. However, it

was uncommon for Company C to have visits by their suppliers. This implied that there were no close relationships between the five focal companies and their suppliers. None of the five focal companies had long-term planning arrangements with their suppliers and the current and following season orders were discussed informally during these infrequent visits.

All of the five focal companies appeared to have difficulties in communicating with most of their suppliers which was less evident in Company D. This resulted in minimised discussion and therefore, lower opportunity to build closer relationships. The impact of this was a lack of efficiency and effectiveness seen in the low accuracy of information shared, most noticeably at Company A, B and E. The Quality Manager of Company A played a key role for overcoming the communication difficulty with the companies who spoke Italian, but there was still communication difficulty with the suppliers who spoke other languages.

Company A, B, D and E considered that their suppliers are not strategic partners because they did not show interest in building closer relationships. Therefore, there was not much mutual understanding built between these focal companies and their suppliers and commitment appeared to depend on commitment with the customers who nominated these suppliers. Company C had long relationships duration with its suppliers that were built based on mutual understanding, but the relationship did not appear to have developed over time to a strategic level. Nonetheless, there appeared to be commitment in the relationship due to the historical dependence. Company C was different from the other four focal companies in that it had written contracts with their major suppliers. The result of the long relationship duration was higher mutual understanding and higher opportunity for commitment. However, the impact of this on the supply chain performance was not visible.

In summary, none of the five focal companies managed the relationship with its suppliers closely. For instance, there were limited mutual visits and generally, a lack of dedicated resources in the relationship between the five companies and their suppliers. This was referred to the lack of willingness because of working based on nominated supplier model seen in four of the companies and the lack of understanding of external supplier integration in one of the companies. The lack of close relationships and regular contact between the five focal companies and their suppliers appeared to produce low information visibility. The long relationship duration in one company appeared to create

an embedded relationship with its suppliers. The impact of this embedded relationship was relatively increased levels of mutual understanding and commitment. Most of companies were also similar in that they had communication difficulties with their suppliers which resulted in minimised communication and discussions. The impact of this was sharing limited and relatively inaccurate information. Table 6.9 below summarises the findings from supplier actors' integration generalisations across the five cases.

External Supplier Integration	Actors
	Generally, it was observed that there was a lack of regular contact and close relationships in all cases which appeared to produce low information visibility. However, the embedded relationship appeared to increase mutual understanding and commitment. It was also found that there were communication difficulties with suppliers because of language difference resulting in sharing limited and inaccurate information. The nominated supplier model seen in four of the five cases appeared to affect the levels of communication, long-term relationships and mutual understanding.

Table 6.9: Findings from across supplier actors' integration generalisations

Using the RBV VRIN characteristics, there was a little value in the resource created as a result of the supplier actors' integration in Company C as it only contributed to create a better commitment seen in the embedded relationship. However, supplier actors' integration in Company A, B, D and E provided greater focus seen in the reduced supply base, less transactions and simplified procedures which created a valuable resource for these four focal companies, but was not considered great in any case. Nonetheless, there was nothing special in the relationships developed between the five focal companies and their suppliers which might create a rare resource. The nature of the relationships was seen as imitable and substitutable. Therefore, the resource created as a result of supplier actors' integration in all cases did not have the potential for generating a competitive advantage. Table 6.10 below summarises the VRIN evidence from the findings in the supplier actors' integration.

External Supplier Integration	Actors	
	V	The value this resource created in most cases was limited as there was limited mutual understanding and commitment in the relationships. Moreover, generally the language barrier appeared to affect the supplier actors' integration.
	R	This resource was not seen as rare in any case as there was nothing such as high mutual understanding and commitment in the relationship. The relationships were generally built based on performing the business transactions.
	I	The lack of close long-term relationships and mutual understanding between the five focal companies and their suppliers was seen as resource that could be easily copied by other supply chains.
	N	As this resource was not seen as rare or inimitable in all cases, it is considered that is not non-substitutable. This resource could be substitutable by a higher level of interaction and a closer relationship.
	VRIN	The resource that was developed as a result of supplier actors' integration did not seem to have the potential for generating a competitive advantage.

Table 6.10: The relevance of the RBV-VRIN to the supplier actors' integration across the cases

6.2.2 Supplier Information Integration

The five focal companies appeared to be similar in that they did not share much strategic information with their suppliers. The reason for this in Company A, B, D and E was that the final customers transferred strategic information such as forecast directly to suppliers every three to six months. This allowed the suppliers to have a better planning of their production and purchasing capacities. However, the impact on the focal companies was that they received material in a shorter lead time. Company A, B and E suggested that the direct transfer of information by the final customers to the nominated suppliers reduced the accountability of these focal companies of any information inaccuracy. Hence, it is implied that the nominated supplier model restricted information visibility between Company A, B, D and E and their suppliers. Company C did not share any regular strategic information with its suppliers, but rather information such as forecast was transferred informally during the seasonal visits every six months by Company C's senior management. This informal forecast was not seen as useful and did not result in any visible benefits for the relationship. Moreover, Company C transferred information about future visits and the needed raw materials to its suppliers' agents approximately three months in advance. The transfer of the future visit information helped the agents search for and identify the appropriate fabric mills. Nonetheless, Company C's Purchasing Manager was not able to make a sourcing decision before visiting the selected fabric mills by the agent.

The five focal companies received infrequent operational information such order status and delivery details from their suppliers after placing an order. Such information was transferred to the five focal companies only when requested from their suppliers. None

of the five focal companies had real-time access to operational information such as production schedules and stock levels with their suppliers. The five focal companies also resembled each other in that operational information was received from suppliers through communication tools, mainly email and that it was more significant than information sent upstream to their suppliers. Company A, B and E explained that suppliers would sometimes transfer vague information such as inaccurate delivery details in order to conceal a drop in service or expectations that they could not meet. Therefore, this type of information was considered to be inaccurate. Hence, the information received from suppliers considered relatively of low quality by Company A, B, C, D and E. The infrequency of information shared and the lack of a direct technological link produced lower visibility between the five focal companies and their suppliers. There was no willingness or interest by Company A, B, C and E to improve the information visibility with their suppliers however, Company D and its supplier showed willingness if it was suggested by the other party. The lack of willingness appeared to be related to the belief by Company A, B and E that these nominated suppliers exist for only performing the daily business transactions based on the business with the final customers although this was less evident in Company D. Company C and its suppliers showed a lack of understanding as to the importance of sharing high quality forecast and market information to produce higher information visibility.

In summary, there was little information sharing between the five focal companies and their suppliers which produced limited visibility. Whereas this was linked to the nominated supplier model in four of the companies, it appeared to be related also to the lack of understanding of sharing full information with suppliers in one company. The four companies who worked based on a nominated supplier model did not transfer frequent information to their suppliers, although the final customers transferred forecast-related information and order details directly to these suppliers. This supported the production and logistics planning of the suppliers and reduced the lead time for the focal companies. However, such behaviour restricted the visibility between the nominated suppliers and the focal companies. One company transferred only informal forecast information and notifications about the future visits to their suppliers' agents. This did not seem to result in high impact, and the company suffered from frequent stock-outs of some items and large quantities of obsolete fabric held in stock. Table 6.11 below summarises the findings from supplier information integration generalisations across the five cases.

External Supplier Integration	Information
	Generally, there was limited information sharing in all cases which produced limited visibility which appeared to restrict achieving high supplier material integration. In one case, having low visibility with suppliers seemed to impact the frequent shortage of fabric and high stock levels. The nominated supplier model appeared to restrict achieving high visibility and information integration with suppliers.

Table 6.11: Findings from across supplier information integration generalisations

Using the ‘RBV VRIN’ characteristics, it is argued that the resource created as a result of the little sharing of information and the lack of real-time access to information between the five focal companies and their suppliers created limited visibility. This limited visibility created little value seen in facilitating the sharing of information related to performing the daily business transactions. However, this resource was not seen as rare in any of the five cases as it was not supported by a high visibility and close relationship. This resource seemed to be imitable by competitors as there was nothing that would make it difficult to copy such as social complexity or causal ambiguity. Therefore, it is said to be substitutable by other resources that are characterised by sharing high quality information and could produce higher visibility. Hence, the limited visibility achieved in this resource did not have the potential for achieving a sustainable competitive advantage. Table 6.12 below summarises the VRIN evidence from the findings in the supplier information integration.

External Supplier Integration	Information	
	V	A valuable resource was created in all cases as a result of information sharing amongst the five focal companies and their suppliers. However, the value was not great as the lack of a real-time information transfer and the limited technological integration did not produce distinctive visibility.
	R	There was no evidence of the rareness of this resource in any case. The limited sharing of information through communication tools did not produce high integration that would produce high visibility and generate a rare resource.
	I	This resource was not seen as inimitable in any case as there was nothing such as real-time access to information that was supported by actors’ integration that would create a difficult to imitate resource.
	N	This resource was seen as substitutable in all cases as there was nothing such as high visibility that was developed over time that could be non-substitutable. This resource could be replaced by sharing high quality information.
	VRIN	The resource created as a result of supplier information integration seemed to have a limited potential for generating a competitive advantage.

Table 6.12: The relevance of the RBV-VRIN to the supplier information integration across the cases

6.2.3 Supplier Material Integration

Company A, B, D and E sourced materials only after winning a new customer order whereas Company C was different in that materials were sourced based on annual

anticipation of future demand. For Companies A, B, D and E, the nominated suppliers were notified of the needed raw materials by the final customers ahead of time. The impact of this on suppliers was a shorter production lead time, faster response and improved planning. Company C did not share information about future material with their suppliers; however, advanced notifications of future visits were transferred to the agents three months in advance. This allowed the agents to search for the needed material and identify the appropriate fabric mills. Nevertheless, this did not result in any visible impact on material integration, as Company C's Purchasing Manager was able to make a sourcing decision only after visiting the fabric mills.

There appeared not to be much collaboration in managing inventory or the way material was shipped from suppliers to the five focal companies. In all cases, materials were usually shipped by a carrier who was arranged by the focal company and it was uncommon for any of these five focal companies and their suppliers to get involved in discussions about a better coordination of shipping. However, Company A had little discussion with its suppliers about whether a different route or carrier would provide a higher efficiency in terms of lower price, speed and availability. Company A had an unwritten agreement with its suppliers to hand over the ready-for-shipping material to its logistics service provider during holidays in Jordan. This was useful to overcome the time difference between the Far East and Jordan where, otherwise, the supplier would wait until the following working day to take permission from Company A before despatching its orders. Company A and D coordinated with their suppliers the consolidation of the orders of more than one suppliers to be shipped on the same container which appeared to cut the shipping costs. However, Company A, B, C and E suffered from the language difference when dealing with their Far Eastern suppliers. This was most apparent in Company A where the company experienced receiving the incorrect materials as a result of the lack of understanding by their Far Eastern suppliers of the communication conducted at earlier stages. The lack of trust with its suppliers made Company A experience prolonged procedures in terms of ensuring that the cost of goods were received before the supplier despatched the ordered raw materials. This seemed to increase the delivery lead time from suppliers.

There was no real-time access to material details such as inventory levels and delivery status by either party and such details were transferred through email in all cases. The lack of regular sharing of material details and information visibility between the focal companies and their suppliers seemed to impact on the level of material integration.

Company A, B and E explained that their suppliers would sometimes transfer inaccurate delivery details in order to hide the actual despatch time as a result of the lack of information visibility. None of the five focal companies had any inventory management initiatives such as vendor managed inventory (VMI) for managing the material with their suppliers. Whereas Company A, D and E referred the lack of inventory initiatives to the restriction of the nominated supplier model, Company B and C appeared to lack the understanding of the inventory management initiatives. In fact, none of the five focal companies considered supplier material integration as a strategic issue that would worth further collaboration or having dedicated resources. This seemed to be a restrictive belief which did not support developing activities that would improve the smoothed flow of material. There was frequent changing of shipping mode and variability in on-time delivery to Companies A, B and E from their suppliers. Nonetheless, Company A, B, C, D and E had standardised procedures for sourcing materials from their suppliers. This included the standardisation of shipping terms, the carrier company used and when to use a specific shipping mode.

In summary, the importance of closely coordinating the material flow with suppliers was not well understood in most companies. None of the five focal companies had any inventory management initiatives or a real-time access to material details with their suppliers. This produced limited information visibility which appeared to restrict achieving higher supplier material integration. The lack of material information visibility resulted in frequent changing of shipping mode, variance in on-time delivery and mistrust in the actual order status seen in most cases. Although there were standardised procedures for sourcing and shipping material between the five focal companies and their suppliers, the lack of close coordination such as coordination in selecting carriers, finding a shorter route and reducing the shipping costs did not support supplier material integration. In two of the companies, there was limited coordination mainly through the consolidation of orders shipping from more than one supplier which appeared to reduce shipping costs. The lack of close coordination in one company seemed to impact on the stock control where there was holding excess fabric in stock and shortage of some types of fabric. Table 6.13 below summarises the findings from supplier material integration generalisations across the five cases.

External Supplier Integration	Material
	Supplier material integration was limited in all cases. The lack of visibility of material information appeared to impact on achieving supplier material integration. Generally, this resulted in frequent changing of shipping mode, variance in on-time delivery and mistrust in the actual order status. Moreover, in one case, there was frequent shortage of fabric stock and high stock levels of fabric at the end of season. However, the limited coordination of material flow seen in the consolidation of orders from suppliers resulted in cutting shipping costs. The nominated supplier model appeared to produce low material integration.

Table 6.13: Findings from across supplier material integration generalisations

Using the RBV VRIN characteristics, it is argued that the value provided by the way material flow was managed between the five focal companies and their suppliers is questioned as it was not seen as rare. Moreover, there was no evidence of improved efficiency or effectiveness as a result of supplier material integration. The way material flow was integrated appeared to be easily available to other competitors. This appeared to be mainly related to the customers' behaviour of working with the focal companies based on a nominated supplier model. This resource seemed to be easily imitable in all cases as it did not appear to be difficult to copy because of its unique interaction with other resources or having a causal ambiguity. In addition, this resource was not seen as non-substitutable as it could be replaced by similar strategies by other companies due to the lack of its rareness and inimitability. Therefore, it is contented that the potential for developing a sustainable competitive advantage through the supplier material integration appeared to be limited. Table 6.14 below summarises the VRIN evidence from the findings in the supplier material integration.

External Supplier Integration	Material	
	V	The value provided in the resource created as a result of supplier material integration was not great. The value produced was limited to the arrangement of material sourcing.
	R	There was nothing special about the resource created as a result of supplier material integration such as inventory initiatives or dedicated resources that are embedded in the relationship or have a unique culture. The way supplier material flow was designed was not seen as rare.
	I	This resource was seen as imitable in all cases. The way supplier material integration was managed did not appear to be difficult to copy because of its unique interaction with other resources or having a causal ambiguity.
	N	This resource was not seen as non-substitutable as it could be replaced by similar strategies by other companies due to the lack of its rareness and inimitability.
	VRIN	The resource created as a result of supplier material integration did not appear to have the potential for generating a competitive advantage.

Table 6.14: The relevance of the RBV-VRIN to the supplier material integration across the cases

6.2.4 Supplier Technological Integration

The five focal companies were similar in that the technological connection with their suppliers was limited to communication tools. Email was the major medium for information sharing such as material details, delivery details and order status and document attachments between the five focal companies and their suppliers. Email was seen by the focal companies as a key tool that is easy to use by all of the supply chain members. However, evidence collected from Company B and E showed that the intensive sharing of information through email did not allow sharing of an easy-to-understand format of information. Moreover, it did not provide information visibility between these focal companies and their suppliers. There was also occasional use of phone by all of the focal companies for information sharing with their suppliers. Company A, B and D used also conference calls and videos mainly through Skype infrequently for connecting with their suppliers. Company A, B and C benefited from fax occasionally for sharing documents such as invoices and shipping documents with their suppliers; however such documents were mainly shared via email. These communication tools were seen as useful to facilitate the sharing of information with suppliers; however their use did not seem to provide information visibility with suppliers.

None of the five focal companies had a technology that enabled a real-time access to information or had a dedicated technological investment for facilitating information sharing with their suppliers. Company A, B, and E and their suppliers considered that the type of the relationship does not require investing in information sharing system and that email and other communication tools were sufficient to transfer information in the relationship. These three focal companies considered that working based on a nominated supplier model did not encourage them to make such investments as the nominated suppliers had direct technological linkages with the final customers. This belief seemed to be restrictive as there was a frequent sharing of operational information via email between these focal companies and their suppliers. Nevertheless, Company D's suppliers showed willingness to invest in information sharing system if it was requested by Company D. This was referred to the large volume of business between Company D and its suppliers. Company C and its suppliers appeared to lack the understanding of the benefit of having information sharing systems with their suppliers. The understanding of technological connection between Company C and its suppliers was limited to communication tools through email, phone and fax. The customers of

Company C reported that the company had frequent shortages of some types of fabric which explains the impact of the lack of visibility between Company C and its suppliers.

In summary, none of the five focal companies was technologically connected with their suppliers through a dedicated information sharing system. The five companies were similar in that they used mainly email for information sharing. This did not support producing high visibility due to the lack of real-time access to information by either party. Other communication tools of phone, fax and conference calls were used infrequently and appeared to be as transacting technologies that did not facilitate high technological integration and information visibility. The nominated supplier model appeared to restrict investing in dedicated technologies for information sharing. However, the lack of technological investments in one company appeared to be related to the lack of understanding as to the importance of information sharing systems with its suppliers. Table 6.15 below summarises the findings from supplier technological integration generalisations across the five cases.

External Supplier Integration	Technological
	None of the focal companies had a dedicated information sharing system with their suppliers and email was the major medium of information sharing in all cases. This did not support providing high quality information mainly due to the lack of real-time access to information by either party. The nominated supplier model appeared to restrict investing in dedicated technologies for information sharing. Another restriction of having dedicated investments found to be related to the lack of understanding as to the importance of technological integration with suppliers.

Table 6.15: Findings from across supplier technological integration generalisations

Using the RBV ‘VRIN’ characteristics, there was a little value produced as a result of using the email and other communication tools seen in facilitating the sharing of operational information and making the sourcing arrangements between the five focal companies and their suppliers. The use of communication tools was not seen as a rare source as it is widely used by other companies. Moreover, there was no willingness to share information and there was no high visibility produced as a result of this resource. This resource was seen as imitable by other companies as it was not supported by any characteristics that would make it difficult to copy. Therefore, the resource that was created as a result of supplier technological integration is highly likely to be substituted by other technologies that are widely available for competitors. Hence, this resource did not appear to have the potential of achieving a competitive advantage in any of the five

cases. Table 6.16 below summarises the VRIN evidence from the findings in the supplier technological integration.

External Supplier Integration	Technological	
	V	There was a little value produced as a result of using the email and other communication tools seen in facilitating the sharing of operational information and making the sourcing arrangements.
	R	The use of communication tools did not appear to create a rare resource as such technology is widely used by other companies. Moreover, there was no willingness to share information and there was no high visibility produced as a result of this resource.
	I	This resource was seen as imitable by other companies as it was not supported by any social complexity that would make it difficult to copy.
	N	This resource is highly likely to be substituted by other technologies that are widely available for competitors.
	VRIN	The resource that was created as a result of supplier technological integration did not appear to have the potential for achieving a competitive advantage.

Table 6.16: The relevance of the RBV-VRIN to the supplier technological integration across the cases

6.3 External Customer Integration

6.3.1 Customer Actors Integration

Whereas there were slight differences in the way relationships with customers was managed by Companies A, B, D and E, the way Company C managed the relationship with its customers was significantly different from the other four companies. Company A, B, D and E had visits by their customers during the order development stage in order to ensure that they have the appropriate work environment and resources of production lines, manpower and quality capabilities for making the potential order; however, this was not evident in Company C. Moreover, these four companies had visits by their customers during the order fulfilment stage every two months in order to follow up their orders during the production process and provide technical advice. Company B and D had more regular visits twice a week by their customers who operated sourcing offices in Jordan. Company A, B, D and E made visits to their customers every 3-6 months in order to discuss the future order quantities and prices. These four focal companies reported improved production capacity planning and production quality. However, Company E worked under its full production capacity during the low seasons. Company C did not make visits to its customers however, they had visits by their customers every new season in order to choose from the stocked fabric, negotiate and place their seasonal orders every 6-12 months. Therefore, there appeared to be limited interaction between Company C and its customers which restricted information visibility. Company

C suffered from a lack of ability to have long-term capacity planning seen in the underutilised production lines and high stock levels at the end of the season.

Companies A, B, D and E had dedicated customer service for managing their customers' accounts. This was seen as necessary for making a regular contact, regular sharing of information and problem solving. However, whereas Company A, B and E had a dedicated customer service to handle the different elements of customers' accounts, Company D was different in that it had dedicated customer service teams where every member of this team was responsible for dealing with each single activity of delivery, quality and production planning separately. This specialised dedicated customer service resulted in higher customer satisfaction, higher information visibility and effectiveness in dealing with delivery. Company C, on the contrary, did not have a dedicated customer service and had communication problems in the relationship with its customers represented by lack of regular contact and limited mutual visits. The customers of Company C reported lower satisfaction, lower information visibility and inefficiency in handling customers' orders seen in the high out-of-stock levels. Moreover, Company C had disruption in the production operations represented by underutilising the production resources such as manpower and production lines. Companies A, B, D and E had on-site customers' quality assurance representatives based at their production facilities in order to allow closer communication and control of quality. There were improved quality levels and customer satisfaction of the quality of garments produced at these four focal companies however, this was greater and more evident at Company A. These on-site based quality representatives at Company A, B, D and E were mainly involved in the technical issues of quality and were not involved in the other aspects of the relationship. However, the customers' quality representative at Company E intervened occasionally in the daily business transactions with Company E. This did not seem to result in any clear impact on the relationship. Company C was different in that it did not have on-site based quality representatives from their customers. Nonetheless, the evidence collected from Company C's customers suggested that there were acceptable levels of garments quality produced and that the dissatisfaction was related to the inflexibility in communication and information transfer with Company C.

The dedicated customer service, integrated EDI connection and the on-site customer quality representatives at Company A, B, D and E implied that there was an unwritten agreement of relationship commitment. Moreover, some of Company B and D major

customers had sourcing offices in Jordan and Company B had a sourcing office in the USA where most of its customers were located in order to make a closer contact. The sourcing offices in Jordan seemed to indicate higher commitment but also resulted in closer communication and higher visibility seen in the regular sharing of high quality information in the relationship through on-site weekly visits and updates. Company E did not have long relationship durations with its customers which seemed to impact on the relationship commitment. There did not seem to be an embedded relationship between Company E and its customers despite the integrated EDI connection and on-site customer quality representatives at Company E. This appeared to be related to the high turnover of employees at Company E which did not seem to allow the dedicated customer service teams to develop closer relationships with their customers. However, Company C was different from the other four focal companies in that it did not have any dedicated investments with their customers. Nevertheless, it was expected that there will be commitment between Company C and its customers because of the long relationship duration and mutual understanding that was built over time. This created an embedded relationship which appeared to impact on the continuity of the business and produce high commitment. Mutual understanding was viewed as a key element of the relationship in the five case studies. Moreover, Company A's customers reported improved information quality and visibility and higher efficiency seen in the reduced revising of the information received as a result of trust in the relationship with Company A.

In summary, there were close relationships based on mutual understanding between most of the focal companies and their customers. The dedicated customer service and regular visits enabled relationships to be developed and appeared to produce higher visibility seen in the improved garment quality in all cases and improved responsiveness and capacity planning at three of the companies. However, the impact of the dedicated customer service on the relationship was greater when there was customised customer service for each function such as delivery, quality and sourcing. Mutual understanding appeared to be a key factor in managing the relationship between the five focal companies and their customers and the relationship was expected to continue for the coming years with customers. The long duration of the relationship with customers appeared to create an embedded relationship resulting in higher mutual understanding and commitment. Table 6.17 below summarises the findings from customer actors' integration generalisations across the five cases.

External Customer Integration	Actors
	Generally the close relationship through the dedicated customer service and regular mutual visits appeared to produce higher visibility seen in the high responsiveness and improved capacity planning and quality. The long relationship duration with customers created an embedded relationship which appeared to create higher mutual understanding and commitment.

Table 6.17: Findings from across customer actors' integration generalisations

Using the RBV VRIN characteristics, it is argued that the relationship that Companies A, B, D and E had with their customers was valuable in that it improved responsiveness. However, there was little value produced in Company C as a result of the relationship with its customers. Although Company B and E had close relationships with their customers, there was nothing special that would make them rare. It is argued that other garment manufacturers could develop similar relationships with their customers. Therefore, they are seen as imitable and substitutable relationships. However, the resource that was created as a result of the relationship that Company A and D had with customers was seen as rare. The dedicated customer service teams for each function created a resource that was also seen as imperfectly imitable and non-substitutable. Therefore, it is argued that the resource created as a result of customer actors' integration in Company A and D had the potential of achieving a competitive advantage. Table 6.18 below summarises the VRIN evidence from the findings in the customer actors' integration.

External Customer Integration	Actors	
	V	This resource created great value in most cases. The great value was generally referred to the mutual understanding, dedicated customer service and commitment. The value was little when there was no mutual visits and regular sharing of information.
	R	There was limited evidence on the rareness of this resource. Where this resource was found to be rare there was customised dedicated customer service which created a close relationship and higher flexibility, and there were also mutual visits and higher mutual understanding which supported producing visibility. However dedicated customer service, mutual visits and close relationships are common practices in today's supply chains and there was nothing special arrangements in the relationship.
	I	Where this resource was found to be inimitable, it appeared to be socially complex to imitate the way in which dedicated customer service produced a competitive advantage. History-dependent relationships based on mutual understanding were seen as difficult to imitate.
	N	Where this resource was seen as non-substitutable there was specific relationship that is difficult to be substituted by other resources such as technology or recently developed relationships.
	VRIN	Customer actors' integration has potentially contributed to competitive advantage through mutual understanding customised dedicated customer service and commitment.

Table 6.18: The relevance of the RBV-VRIN to the customer actors' integration across the cases

6.3.2 Customer Information Integration

Company A, B, D and E received generic forecast-related information on garment quantities and construction from their customers every season. This was every three months for most of these four focal companies' customers and every six months for a small number of customers. Although this forecast did not include detailed information such as colour and size, it was essential for these four focal companies to allow aggregate planning of production capacities, logistics resources, reduce the variability of production and delivery lead time and to book the raw materials needed with the appropriate suppliers. However, Company A, B and E reported changes in the customer orders at later stages although this seemed to have little impact on capacity planning for Company B. Most of Company B's customers had sourcing offices in Jordan and the company itself operated a sourcing office in the USA where most of its customers were located in order to increase information visibility. The customers of Company A, B and D showed great understanding of the importance of sharing forecast-related information at early stages in order to allow accurate capacity planning. Company E suffered from low production capacity utilisation due to the short planning and sharing forecast-related information (every 3-6 months) which was not seen as a sufficient period to have accurate capacity planning. Nonetheless, the strategic information shared appeared to be trustworthy, useful and easy to use. On the contrary, there was no evidence that the transfer of market information by customers provided any clear benefits for Company C. The way this type of information was shared by Company C's customers was informal and irregular which did not support making decisions or allow accurate planning before placing an actual order. There was short-term planning of production resources which produced low productivity in Company C represented by underutilising the production lines. Company C also suffered from high stock levels of raw materials and finished garments at the end of season. Moreover, the quality of strategic information shared by Company C with its customers seemed to be inaccurate. The customers of Company C reported inaccuracy in the shared future order capacities and the available stock of particular types of fabric. The lack of frequent information sharing with customers seemed to reduce the operational benefits gained from internal integration. For example, although the company had full access to information internally through meetings, ERP, email and daily interaction, it neglected achieving high visibility with its customers. This seemed to restrain the impact of internal

integration on the internal operations seen in the high stock levels held in stock and the lack of long-term production capacity planning.

Sharing of operational information such as production schedules and delivery updates was significant between Companies A, B, D and E and their customers. Although there was no real-time access to operational information between these four companies and their customers, the EDI and close coordination allowed sharing of high quality information. Moreover, the regular site visits by the customers of these four focal companies enabled timely sharing of operational information. This was most evident in Company B and D as they had a number of customers who operated sourcing offices in Jordan and were able to make daily and weekly visits through which much timely operational information was shared. Moreover, Company A and D shared more detailed operational information such as pallet size, packaging measurements and shipping routes through integrated EDI systems with all of their customers. The benefits of sharing high quality operational information was improved on-time delivery, reduced delivery variation and better production and logistics planning. Moreover, Company A and D's customers reported greater visibility levels and higher responsiveness. The exception was Company C who did not have certain procedures for sharing operational information and only shared when requested to by customers. The customers of Company C reported inflexibility in communication and information transfer with Company C and a lack of information visibility.

In summary, sharing of high quality information between three of the focal companies and their customers seemed to produce higher visibility, improved production and resource capacity planning. However, the sharing of forecast-related information less than six months prior to the start of production process by customers did not produce accurate capacity planning. The lack of regular sharing of information between one company and its customers resulted in lower visibility and customer dissatisfaction and seemed to restrict the long-term planning of logistics resources and production capacity. Moreover, this company suffered from high inventory levels and out-of-stock of raw materials which appeared to be related to the lack of visibility with customers. Table 6.19 below summarises the findings from customer information integration generalisations across the five cases.

External Customer Integration	Information
	The forecast-related information produced improved capacity planning only when was of high quality particularly accuracy and shared more than six months in advance. The lack of regular sharing of information resulted in lower visibility and weak stock control. Moreover, this resulted in customer dissatisfaction and seemed to restrict the long-term planning of logistics resources and production capacity.

Table 6.19: Findings from across customer information integration generalisations

Using the ‘RBV VRIN’ characteristics, it is argued that the regular sharing of high quality information between Companies A, B and D their customers created a valuable resource. However, this resource produced a lower value in Company C and E. This resource was not seen as rare in Company B, C and E as there did not appear to be high visibility. Therefore, the resource that was created in these three companies was not seen as inimitable and is said to be substitutable. Hence, the potential for achieving a sustainable competitive advantage was limited. The situation in Company A and D was different in that information shared had a higher quality and frequency. However, although the resource created was also seen as rare, the lack of real-time access to information through information sharing system in Company A did not support producing a distinctive visibility. Nonetheless, Company D appeared to have a high visibility that was produced as a result of customised dedicated customer service and regular site visits and high quality sharing of forecast-related data. Therefore, the potential for achieving a sustainable competitive advantage through this resource was also limited in Company A; however, it was higher for Company D. Table 6.20 below summarises the VRIN evidence from the findings in the customer information integration.

External Customer Integration	Information	
	V	A valuable resource was created in all cases. However, the value produced was higher when there was regular sharing of high quality information. It was also found that the earlier the forecast-related information was shared the higher was the benefit for both meeting customers' enquiries and better planning of internal capacity.
	R	There was limited evidence where this resource found to be rare. The customised dedicated customer service produced higher flexibility and visibility. However, this resource was not seen as rare where there was nothing special about the regular sharing of information.
	I	There was limited evidence on the inimitability of this resource. Where this resource was found to be inimitable there was regular sharing with information supported with dedicated customer service and mutual visits.
	N	This resource was seen as non-substitutable only when there was regular sharing of high quality information supported with high actors' integration.
	VRIN	Customer information integration appeared to contribute to competitive advantage through the regular sharing of high quality information, regular interaction and embedded relationship.

Table 6.20: The relevance of the RBV-VRIN to the customer information integration across the cases

6.3.3 Customer Material Integration

As all of the five focal companies manufactured garments, they all shipped finished goods to their overseas customers. None of the five focal companies had inventory management initiatives such as vendor managed inventory (VMI) with its customers which might indicate that there is high material flow coordination. However, some of Company D's customers kept fabric stock at Company D's warehouses to meet any changes in future orders. This resulted in reduced lead time of fabric reordering from the Far Eastern suppliers. The five focal companies were also similar in that none of them had a real-time access to material details such as stock levels and work-in-progress with their customers. Such details were mainly transferred on a daily basis through email in all cases although this was less frequent in Company C who transferred material details only when requested by customers. Moreover, Company A, B, D and E transferred material details on a daily basis through EDI connection. The customers of Company B and D who operated sourcing offices in Jordan were also able to obtain material details through regular daily and weekly site visits. Company A and D were different in that they even shared with their customers the small details of materials such as pallet size, garment packaging and container type. The customers of Company A and D reported that there was high information visibility with these two focal companies which smoothed the material flow process.

Company A, B, D and E adopted a make-to-order strategy for serving their international customers. For each new order, these four companies stocked small percentages of unallocated buffer inventory for potential order amendments or shrinkage because of

any possible quality defects. This resulted in high inventory efficiency seen in the low stock levels of fabrics and work-in-progress at these companies. Although Company C adopted a make-to-stock strategy, there was no clear coordination for a better management of inventory with customers. Moreover, Company C also stocked fabric in anticipation of future customer demand. There was no real-time market information transfer from Company C's customers and inventory was decided based on general forecasting from historical data. The company had high levels of fabric and trim stock at the end of season and suffered from frequent shortage of fabric. In the case of fabric stock unavailability, Company C had to arrange the sourcing of the required fabric and then start production which lengthened the supply lead time. This resulted in dissatisfaction of their customers which was also referred to the lack of regular sharing and visibility of material details.

Company A, B, D and E had to work with forwarders nominated by their customers for the delivery of finished garments. None of these four focal companies appeared to be engaged in discussion with their customers for suggesting or arranging a better forwarder. However, Company E had limited discussions with its customers about the changing of shipping routes and modes. Nonetheless, this did not result in any visible impact. Company C was different from the other four companies in that it arranged the forwarders who delivered to their customers and it did not use nominated forwarders. Nonetheless, Company C had limited coordination with its customers in managing shipping of goods. Shipping between Company C and its customers was left to market competition based on price. Whereas the nominated forwarders appeared to restrict collaboration and close coordination between Company A, B, D and E and their customers, it provided a route map and clearly identified procedures for the transference of goods. These four companies' customers used single forwarders who were seen as highly experienced in their field and were also able to provide lower charges as a result of the high volume of business they handled for these customers. Moreover, the high knowledge and expertise of these customers in the material management appeared to improve the efficiency of this link. These companies' customers were international branded garment retailers and buying houses who had long experiences in this field. Company B benefited from the close relationship with its customers in achieving a higher coordination in reducing the costs of shipping. The company was able to avoid shipping the orders that it was not able to meet their production lead time via airfreight and use the sea freight because of the close relationship and mutual understanding it had

with their customers. This was also observed in Company A and D where the high customer satisfaction that was reported through the interviews with their customers allowed smoother material flow. The customised dedicated customer service that Company D adopted in dealing with its customers, allowed the company to stay in close contact with any arising issues regarding material flow. It was also observed that the high expertise of Company A, B, D and E' customers in dealing with material flow management enabled this link to be smoothly managed. Company C itself had long experiences in dealing with international customers which accumulated high knowledge in this activity, however, the lack of information integration with customers seemed to restrict achieving high benefits from customer material integration. The majority of customers of Company A and E, being located in Europe, were able to reduce the delivery lead time benefiting from the geographical proximity of their Jordanian vendors. For example, the impact of this in Company A was that its Turkish customers were able to reduce the delivery lead time from around 35 days when using Far Eastern vendors to around 12 days through using Company A.

In summary, the regular sharing of material information between the focal companies and their customers seemed to improve the level of material integration. On the contrary, the lack of regular sharing of material details and the limited visibility seemed to impact on the material integration between one company and its customers. The high level of customer actors' integration in three of the companies appeared to impact on achieving higher levels of customer material integration. The nominated forwarder model by the customers seemed to restrict collaboration. However, it provided identified procedures for material flow. It appeared that the focal companies and their customers were able to accumulate resources through customer material integration. These resources were seen in the expertise and knowledge of managing material flow, geographical proximity, improved information visibility, identified procedures and the close relationships. Table 6.21 below summarises the findings from customer material integration generalisations across the five cases.

External Customer Integration	Material
	Generally customer material integration appeared to be affected by the level of customer information and actors' integration, the skill set in managing material flow and geographical proximity. The lack of sharing regular material details and visibility seemed to negatively impact on the material integration with customers. The nominated forwarder model by the customers seemed to restrict collaboration. However, it provided identified procedures for material flow. The customer's inventory held at one focal company resulted in shorter reordering lead time.

Table 6.21: Findings from across customer material integration generalisations

Applying the RBV VRIN characteristics, it appeared that the way material flow managed with customers created a valuable resource in terms of improving efficiency through using a highly experienced single forwarder and standardised procedures. This resulted in improved operational information seen in reduced inventory, reliable lead time, and reduced shipping costs. However, the customer material integration was not seen as rare in Company E and C as there was nothing unique in the way it was performed with customers and therefore, it is imitable and substitutable. Hence, the potential for achieving a sustainable competitive advantage through this resource was limited in Company C and E. However, there appeared to be a rare resource as a result of customer material integration in Company A, B and D. There was close coordination through the dedicated material management customer service and higher knowledge and material management expertise. Company A, B and D appeared to accumulate knowledge and expertise as a result of the interaction in managing material flow with their customers. This appeared to create a difficult to perfectly imitate resource. Hence, this resource was seen as non-substitutable in these three cases. There does not appear to be any other resource that would replace the customer material integration that was created as a result of improved customer visibility, accumulation of expertise and the close relationships, and then produce a sustainable competitive advantage. Table 6.22 below summarises the VRIN evidence from the findings in the customer material integration.

External Customer Integration	Material	
	V	This resource was seen as valuable in all cases. However, the value was higher when there was dedicated customer service for material management, higher information visibility, coordination in stock control and identified procedures.
	R	There was limited evidence on the rareness of this resource. Where this resource was found to be rare there was close coordination through the dedicated material management customer service and higher knowledge and material management expertise.
	I	This resource was not seen as inimitable in most cases. Where this resource found to be inimitable there appeared to be knowledgeable people and a complex social situation.
	N	This resource was seen as substitutable in most cases. Where it found to be non-substitutable there appeared not to be other resources such as technology that would offset this resource.
	VRIN	Customer material integration appeared to contribute to competitive advantage through coordination in stock control, higher visibility, knowledge and social complexity.

Table 6.22: The relevance of the RBV-VRIN to the customer material integration across the cases

6.3.4 Customer Technological Integration

The five focal companies were similar in that they used email on a daily basis as the main medium of information sharing with their customers. It was viewed as an easy to use and efficient tool however, it did not provide an easy to understand format of the transferred information and facilitate producing information visibility. Another similarity between the five focal companies is that none of them had any information system that provided a real-time access to information such as point-of-sale (POS) or collaborative planning system (CPS) with their customers. However, Company A, B, D and E recognised that email on its own would not be sufficient to handle the garment business where there are many stock-keeping-units (SKUs) and much information to be shared in a timely manner. These four focal companies were linked with their major customers through integrated and web-based EDI technology which was seen as a useful tool for transferring easy to use, accurate and timely information. This was most evident in Company A where there were integrated and web-based EDI systems with all of its customers. For instance, the company used the WebSphere Portal where data were exchanged in a predefined format by the customer. Moreover, the company used an integrated EDI application through a version of BOSaNOVA which was linked with the internal ERP system of a European customer. Through linking the BOSaNOVA with the internal customers ERP system Company A was able to transfer the details of the manufactured garments so that they appeared as on-hand inventory for its customer. Company B used a version of EDI connection known as XPC through which documents and data were interchanged with customers on a daily basis and at different stages of the order. Another EDI technology that was used at Company B is software known as

TeamSite through which it was connected with two of its major US customers. The XPC and TeamSite applications are web-based and the investment of these applications was made through the customers. Company E used TradeStone application for exchanging data and documents with its customers during the order development and fulfilment. This application was seen as time efficient as it reduces the number of email that would be sent. Another advantage that was reported for the use of TradeStone between Company E and its customers is that the customers were able to compare the costing information received from its different manufacturers. Company D benefited from the EDI technology through the use of several applications such as Retailink, Vendornet, Zone and TeamSite. These applications were seen as facilitators of information transfer through a defined format.

Company A, B, D and E and their customers considered that the EDI technology together with the communication tools particularly email was sufficient to facilitate information sharing. These four companies resembled each other in that they had more than one EDI system which was basically decided according to the customer requirements. The production and supporting functions that used these EDI systems showed understanding as to the importance of technologically integrating with customers through EDI. Company C and its customers did not recognise the other technologies for information sharing that can be used with external customers such as EDI or other information sharing systems. This was seen as restrictive as there was information visibility between Company C and its customers.

Less often, other communication tools of phone, conference calls and videos were used for information sharing between Company A, B, D and E and their customers. Company A, B and C used also the fax for the transfer of information with their customers. There did not seem to be a clear impact of using these communication tools however, these were seen as efficient and easy to use tools. Company C was different in that it did not benefit from the available technological advancements of communication tools such as conference and video calls for integrating with their customers. The only technological connection between Company C and its customers was through email and there was no use of the other communication tools. In fact, there was a call by the customers for Company C to use the emerging communication tools such as Viber and Skype for information transfer as they were seen as efficient and easy to use. The customers of Company C reported a lack of satisfaction because of the inefficiency of information sharing with Company C. The company did not share operational

information regularly with its customers and suffered from the inaccuracy and untimeliness of information shared. This produced lower visibility which resulted in high stock levels, frequent out-of-stock and lower customer satisfaction.

In summary, email was the major medium of information sharing in all cases. Four of the focal companies benefited also from EDI connections for information sharing with their customers. The email and EDI systems were viewed as appropriate tools for making the necessary connection through information sharing. These four focal companies shared high quality information with their customers, had minimised stock levels and near accurate production capacity planning. Three out of these four companies reported high visibility levels in connection with customers. However, this was most evident in two of the companies where there was high actors' integration and high willingness to share high quality information. Only one company did not use any information sharing systems and the use of communication tools was limited to email, phone and fax. The company had low quality of information shared, excess inventory at the end of season and frequent out-of-stock levels. There appeared to be a need for the emerging communication tools such as Viber and Skype to be used in order to increase the customer technological integration. Table 6.23 below summarises the findings from customer technological integration generalisations across the five cases.

External Customer Integration	Technological
	Generally, when the email and EDI system used together, they appeared to facilitate sharing of high quality information with customers and reduces stock levels and near accurate production capacity planning. However, the information shared through these technologies needed to be of high quality in order for the technology to make high customer technological integration. The lack of information sharing systems in one company appeared to produce low visibility resulting in low quality of information shared, excess inventory at the end of season and frequent shortage of fabric. The need for using the emerging communication tools such as Viber and Skype appeared to be of interest by customers.

Table 6.23: Findings from across customer technological integration generalisations

Using the RBV VRIN characteristics, it is argued that the use of communication tools and EDI technology between Companies A, B, D and E and their customers created a valuable resource that enabled sharing of accurate and easy to use information. However, the value produced through this resource was lower in Company C as it only facilitated the day-to-day business transactions. The use of communication tools and EDI in themselves was not seen as rare or inimitable. However, this resource was found to be rare in Company D as there was willingness to share information and high actors'

integration as it was also found to be inimitable. The inimitability of customer technological integration in Company D appeared to be connected with the collaborative behaviours that existed in the relationship and high willingness and confidence of the shared information. This resource appeared to be non-substitutable in Company D as there was intensive use of communication tools and EDI which was supported with embedded culture. Hence, customer technological integration appeared to have a potential for achieving a competitive advantage in Company D. However, this resource was not seen as rare, inimitable and non-substitutable in the other four companies. Hence, the potential for this resource to achieve a sustainable competitive advantage was not evident in Company A, B, C and E. Table 6.24 below summarises the VRIN evidence from the findings in the customer technological integration.

External Customer Integration	Technological	
	V	The use of communication tools and EDI technology created a valuable resource through the facilitation of sharing of high quality information.
	R	There appeared to be limited evidence of the rareness this resource. Although use of communication tools and EDI is not considered rare, however, where this resource was found to be rare there was willingness to share information and high actors' integration.
	I	There was limited evidence of the inimitability of this resource. The inimitability of customer technological integration was found to be connected with the collaborative behaviours that existed in the relationship and high willingness and confidence of the shared information.
	N	This resource was seen as substitutable in most cases. However, where this resource was found to be non-substitutable there was intensive use of communication tools and EDI which was supported with embedded culture.
	VRIN	This resource appeared to contribute to competitive advantage through the use of communication tools and EDI which were supported with collaborative behaviours that indicated willingness to share information.

Table 6.24: The relevance of the RBV-VRIN to customer technological integration across the cases

6.4 Chapter Summary

This chapter developed analytic generalisations based on comparing and contrasting the individual analysis of the five case studies discussed in the previous chapter. These generalisations were summarised into twelve headings as shown in Table 6.25. The relevance of the competitive advantage of the RBV theory to the developed generalisations in this chapter was also discussed and summarised in Table 6.26 shown below.

		Actors	Information	Material	Technological	Summary
Supply Chain Integration	Internal Company Integration	Evident in all cases. However, the presence of customer integration supported producing higher benefits from internal actors' integration.	Evident in most cases. However, the benefits of internal information integration were higher when customer information integration existed.	Evident in most cases. However, the impact was higher in the existence of external customer integration.	Evident in most cases. However, it needed to be supported by effective internal company integration in order to produce higher benefits.	Internal company integration was observed in most cases. Customer integration appeared to impact on reaping higher benefits from internal integration.
	External Supplier Integration	Limited in all cases. Generally, the lack of understanding as to the importance of close relationships appeared to affect the levels of communication, long-term relationships and mutual understanding.	Generally, there was limited visibility with suppliers. The lack of willingness restricted achieving high visibility and information integration with suppliers.	Limited in all cases. The lack of understanding appeared to produce low material integration.	Limited in all cases. The lack of willingness and understanding appeared to restrict investing in dedicated technologies for information sharing.	Limited in all cases. There was a restriction to achieve high external supplier integration in all cases because of either the lack of willingness or the lack of understanding of the external integration.
	External Customer Integration	Evident in most cases. The embedded relationship appeared to create higher mutual understanding.	Evident in most cases. However, the quality of information shared and the higher customer actors' integration produced higher information integration.	Evident in most cases. Generally appeared to be affected by the level of customer information and material integration.	Evident in most cases. Generally, when the email and EDI system were used together, they appeared to facilitate sharing of high quality information with customers, reducing stock levels and producing near accurate production capacity planning.	External customer integration was observed in most cases. The embedded relationship and sharing high quality information produced higher integration.
	Supply Chain Integration Summary	Generally, the focal companies appeared to have relatively high internal company integration, limited external supplier integration and relatively high integration with their customers. Hence, there appeared to be limited supply chain integration across the garment manufacturers. It was found that there was a restriction to have a higher integration because of either the lack of willingness or the lack of understanding as to the importance of external integration especially with suppliers. The customer integration appeared to have an impact on achieving improved and reaping higher benefits from internal company integration.				

Table 6.25: Findings from across case study generalisations

		VRIN	Actors	Information	Material	Technological	Summary
Supply Chain Integration	Internal Company Integration	V	Fulfilled	Fulfilled	Fulfilled	Fulfilled	Fulfilled
		R	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled
		I	Partially fulfilled	Partially Fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled
		N	Partially fulfilled	Partially Fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled
		Competitive Advantage	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled
	External Supplier Integration	V	Fulfilled	Fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled
		R	None	None	None	None	None
		I	None	None	None	None	None
		N	None	None	None	None	None
		Competitive Advantage	None	None	None	None	None
	External Customer Integration	V	Fulfilled	Fulfilled	Fulfilled	Fulfilled	Fulfilled
		R	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled
		I	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled
		N	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled
		Competitive Advantage	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled	Partially fulfilled
The Competitive Advantage Evidence in the Overall Supply Chain Integration		Valuable resource in most cases but limited potential for achieving a competitive advantage					

Table 6.26: The relevance of the RBV theory (Competitive Advantage) to the findings from across case study generalisations

Table 6.26 shows that the potential for achieving a competitive advantage through supply chain integration was limited in the case study research. However, it was found that internal company integration and external customer integration had a potential for achieving a competitive advantage. There was evidence from the case study research that the garment manufacturers were able to accumulate resources through internal integration amongst the production and supporting functions. Moreover, there was accumulation of resources as a result of the integration between the focal companies and their customers. These resources were found to be intangible in most cases and there was limited evidence of the importance of tangible resources to produce a competitive advantage in the garment manufacturers supply chains.

Having developed empirical generalisations through comparing and contrasting the individual case studies and applied the RBV characteristics to evaluate attaining a competitive advantage across the findings, the next chapter will compare and contrast these findings in the context of extant supply chain integration literature.

7. Discussion and the Developed Empirical Model

This chapter will discuss the empirical findings from the case study analysis in the context of previous supply chain integration literature. The theory suggested that the supply chain integration framework incorporates internal company integration, external supplier integration and external customer integration. These three themes were used for analysing the individual case studies in Chapter 5 and were also used in Chapter 6 to inductively identify empirical generalisations. Each theme was analysed in terms of its main constructs of actors' integration, information integration, material integration and technological integration. In this chapter, the three main themes will be used to understand the differences and similarities between the empirical findings from this thesis and the previous literature. The relevance of competitive advantage from an RBV perspective of the main empirical findings will be discussed in this chapter. The purpose is to develop an empirical supply chain integration model that underpins competitive advantage for garment manufacturers serving international customers.

7.1 Summary of Main Empirical Findings

This section summarises the findings that emerged from the across-case analysis in Chapter 6 as follows:

- Internal company integration and external customer integration were found to be more evident in the case study research than external supplier integration.
- The garment manufacturers were not able to reap the full benefits from internal company integration efforts without achieving external customer integration. Particularly, customer information integration and customer material integration were found to impact on the success of internal company integration.
- Customer information integration appeared to be more important than supplier information integration in order to achieve higher benefits from internal company integration.
- Information integration at the three levels of integration of supplier, customer and internal was found to be the key element for achieving supply chain integration. Information integration appeared to impact on achieving integration through the other constructs of actors, material and technology at the three levels of integration.

- There appeared to be a lack of understanding and appreciation in the case study research of the importance of external integration with suppliers.
- Communication difficulty because of language difference appeared to be an issue for Jordanian manufacturers in integrating with their Far Eastern suppliers.
- There was a lack of common beliefs between the focal companies and their suppliers which appeared to restrict achieving higher external supplier integration.
- Long relationship duration created an embedded relationship which resulted in higher mutual understanding and commitment in the relationship.
- The emerging online communication tools such as Viber, Tango and Skype appeared to facilitate efficient and timely information sharing with external customers.
- Achieving competitive advantage through supply chain integration was found to lie in the intangible resources of knowledge accumulation and work routines, personnel relationships and the willingness to achieve integration.
- Garment manufacturers appeared to focus their efforts on internal company integration and external customer integration more than external supplier integration due to the lack of appreciation of the benefits that might be gained from supplier integration.

The next section introduces a discussion of the empirical findings from the case study analysis.

7.2 Discussion

The lack of agreement in literature on the definition and constructs of supply chain integration resulted in drawing several different findings. The predominant belief amongst academics is that supply chain integration has both strategic and operational importance and enables firms to become more competitive (Frohlich and Westbrook, 2001; Bagchi and Skjoett-Larsen, 2002; Fabbe-Costes and Jahre, 2008; Van der Vaart and Van Donk, 2008; Yeung *et al.*, 2009). Nevertheless, the validity of supply chain integration was questioned by some authors (Cousins and Menguc, 2006; Danese and Romano, 2011). The basis for this research was to understand the way firms develop resources through supply chain integration and how these resources might be a source

of competitive advantage. The discussion of the three themes of supply chain integration of internal company integration, external supplier integration and external customer integration is introduced.

7.2.1 Internal Company Integration

Internal company integration was defined from the literature as the degree to which the internal production and supporting functions work closely and collaborate in managing the flows of information and material for the benefit of the firm. The empirical findings suggested that internal company integration was evident in most cases. This is consistent with the theory of integration which suggests that there is a need for integration amongst the functional departments (Pagell, 2004; Chen *et al.*, 2007; Kocoglu *et al.*, 2011; Basnet and Wisner, 2012). Evidence of the importance of internal company integration for a successful supply chain implementation can be found in several studies (Stank, 2001; Vickery *et al.*, 2003; Campbell and Sankaran, 2005; Williams *et al.*, 2013). The impact of internal company integration according to the empirical findings was improved capacity planning, reduced stock levels and reduced production disruptions. Previous studies found that internal company integration was related to improved operational performance (Gimenez and Ventura, 2005; Chen *et al.*, 2007). The empirical findings from Zhao *et al.* (2011) suggested that internal integration is the basis for achieving a successful external integration. However, their study was focused on studying supply chain integration in the cultural context of China.

Generally, the empirical findings reinforced previous studies which found that internal company integration is vital for the firm (e.g. Pagell, 2004; Gimenez and Ventura, 2005; Zhao *et al.*, 2011). However, in order to gain a greater understanding of how the empirical findings relate to the previous literature, the findings from the internal company integration constructs are also discussed. The internal company integration components that were constructed in the theoretical framework from the literature are internal actors' integration, internal information integration, internal material integration and internal technological integration. These components of internal company integration will lead the discussion of this level of integration.

- **Internal Actors' Integration**

Internal actors' integration was defined from the literature as the degree to which the internal production and supporting functions work closely based on cross-functional

teams, shared goals and joint planning. The regular interaction and interdependence amongst the internal production and supporting functions in the case studies were found to be essential for enabling internal company integration. This was mainly achieved during the periodical meetings through cross-functional teams from the production and supporting functions. Firms have long used cross-functional teams to manage various processes closely (Cooper *et al.*, 1997; Chen *et al.*, 2009a) in order to improve quality and innovation (Vickery *et al.*, 2003). The objective of cross-functional teams centres on achieving collaboration between the different functional departments (Vickery *et al.*, 2003). The coordination through cross-functional teams is the most widely cited indicator of internal integration in previous literature (Vickery *et al.*, 2003; Chen *et al.*, 2009a).

The empirical findings suggested that job-rotation and understanding the work of other departments had a positive impact on achieving internal company integration. This finding is consistent with the empirical model of internal integration for Pagell (2004) who studied internal integration between operations, logistics and purchasing. This was also consistent with the empirical evidence from Basnet and Wisner (2012) who studied integration between the value-adding functions in the organisation. The empirical findings suggested that through job-rotation, the production and supporting functions personnel were able to interact with other resources and accumulate skill sets that would increase knowledge. This created a learning environment which is viewed from the RBV perspective as potential source of competitive advantage (Grant, 1996; Rosenzweig *et al.*, 2003). Knowledge accumulation and the skill set of personnel were also found in the empirical case study research to enable the smooth flow of material. The skill set of the employees involved in the material flow process appeared to produce a difficult to replicate resource. When internal material integration was supported with the involvement of highly knowledgeable and committed employees, it created a history-dependent resource which is unlikely to be substituted with another resource that would produce a sustainable competitive advantage.

The embedded culture that was created as a result of informal management structure and job stability was found to increase the benefits reaped from internal company integration. This contradicts the empirical findings from Basnet and Wisner (2012) who suggested that informal interaction between functional groups was not related to achieving internal company integration. However, the empirical findings corroborate

the previous literature of the RBV theory where the informal relationships amongst the internal departments are considered a potential source of competitive advantage (Rosenzweig *et al.*, 2003; Barratt and Barratt, 2012) through creating a unique company culture that results in social complexity (Wernerfelt, 1984; Barney, 1991; Rungtusanatham *et al.*, 2003). While Rosenzweig *et al.* (2003) and Barratt and Barratt (2012) studied consumer products manufacturers, this finding appeared to be also true for garment manufacturers as suggested by the empirical findings.

- **Internal Information Integration**

Internal information integration was defined from the literature as the degree to which the internal production and supporting functions share high quality information that produces internal visibility. The empirical evidence indicated that there was intensive sharing of information amongst the production and supporting functions within the focal companies. This is consistent with the theory of internal information integration which supports the need for internal information sharing (Lee *et al.*, 1997; Lee *et al.*, 2000; Zhao *et al.*, 2002; Kocoglu *et al.*, 2011). The empirical findings showed that the sharing of high quality information amongst the production and supporting functions produced higher internal visibility seen in the smoothed production and material flow. This finding is consistent with Barratt and Barratt (2012) who argued that internal information sharing improves visibility and operational performance. However, their study focused on dyadic information sharing between pairs of departments. The finding showed that information sharing produced a higher level of visibility when it was supported by regular interaction and close relationships amongst the production and supporting functions. This is consistent with recent research on information sharing and visibility (e.g. Kocoglu *et al.*, 2011). The sharing of low quality information among the production and supporting functions in the case study research resulted in poor capacity planning and inefficient stock control. Previous empirical research (e.g. Barratt and Barratt, 2012) found that the lack of high quality information sharing amongst the internal departments has a negative impact on firm performance.

The empirical findings showed that internal information integration was found to be inimitable when there appeared to be high internal visibility supported with an embedded internal relationship. This corroborates with the previous literature which

indicated that information integration amongst the internal functional departments can create capabilities that are potential sources of a competitive advantage for the firm (Chen *et al.*, 2009a). Furthermore, Fawcett *et al.* (2009) argued that company culture has an influence on the sharing of information amongst the internal functions.

- **Internal Material Integration**

Internal material integration was defined in the literature as the degree to which the production and supporting functions collaborate in managing material flow within the company through standardised procedures and close coordination. The empirical findings suggested that internal material integration amongst the production and supporting functions was evident in most cases. This finding reinforced the theory of internal integration which suggests the need for internal material integration (Dubois *et al.*, 2004; Pagell, 2004; Chen *et al.*, 2009a). The empirical findings showed that the close coordination of material flow activities within the company resulted in smoothed production operations and reduced inventory held in stock. This is consistent with the empirical findings from (Gimenez and Ventura, 2005) who found that the internal logistics-production integration reduced the stock-outs level in the presence of external customer integration. However, their study focused on fast-moving consumer goods (FMCG) in the context of Spain and they studied internal company integration in terms of a dyadic interface. This was also consistent with Mishra *et al.* (2013) and Caridi *et al.* (2014) who found that the close coordination of activities and information sharing resulted in improved inventory control for the firm.

However, the empirical findings indicated that the benefits reaped from internal material integration were lower in the absence of external customer and supplier integration. This finding is consistent with the research findings from Williams *et al.* (2013) who found that the visibility achieved through external integration makes the internal integration efforts more valuable.

Sharing of material details only through spreadsheets and lack of internal information sharing system produced inaccuracy of stock levels and inability to deal with repeated customers' orders. This finding confirmed the importance of internal information sharing systems for the effective material flow management (Arshinder *et al.*, 2008;

Mishra *et al.*, 2013). The real-time access to material and production details at most cases was found to be essential for supporting the internal smooth flow of material. This finding is consistent with several previous studies (e.g. Barratt and Barratt, 2012; Mishra *et al.*, 2013) who found that information visibility was related to the smoothed material flow.

Regular interaction and close coordination appeared to create a learning expertise and knowledge in managing internal material flow and increase the efficiency through the standardisation of procedures. It was found that the accumulated experiences, commitment and the involvement of employees contributed to create firm-specific knowledge on how to manage material flow which appeared to create a history-dependent resource. According to the RBV theory, the close coordination of material flow activities within the firm develops capabilities (Chen *et al.*, 2009a) that would contribute to create improved competitive advantage for the firm (Barney, 1991; Grant, 1996). These capabilities resulted from the experiences that developed over time which created a unique history that is not easy to duplicate by competitors (Hult *et al.*, 2006). This is also consistent with Rosenzweig *et al.* (2003, p441) who stated that “when supply chain entities work in harmony over time, transaction-specific know-how accumulates”.

- **Internal Technological Integration**

Internal technological integration was defined from the literature as the degree to which the internal production and supporting functions are technologically connected through information sharing systems and communication tools that enable information visibility. It was found from the empirical case study research that the production and supporting functions in most focal companies were technologically linked mainly through an ERP system and by email for information sharing. This is consistent with the theory of internal company integration which suggests that the use of technology for information sharing amongst the internal departments is essential (Rosenzweig *et al.*, 2003; Pagell, 2004; Rai *et al.*, 2006; Arshinder *et al.*, 2008). However, this finding is inconsistent with the empirical findings from Basnet and Wisner (2012) who found that an enterprise-wide technology for information sharing was not related to achieving internal company integration. The importance of technological integration for achieving internal

company integration was evident in the empirical findings seen in facilitating the full access to information on a real-time basis and increasing the quality of information which appeared to produce internal information visibility. This is consistent with the empirical findings of several previous studies such as those of Rosenzweig *et al.* (2003) and Pagell (2004) who found that internal technological integration facilitated the real-time access to information and improved internal visibility (Kim *et al.*, 2011; Mishra *et al.*, 2013).

The empirical findings also suggested that when email was used in conjunction with the ERP system it contributed to improved internal information visibility. This is consistent with the research findings from Barratt and Barratt (2012) who found that information sharing through email resulted in some operational improvements; however, it did not produce high visibility. The empirical findings also indicated that the lack of an internal information sharing system (Mishra *et al.*, 2013) and the use of email on its own created limited visibility which appeared to restrict high material integration. The use of spreadsheet attachments through email on its own did not facilitate information integration that could make great improvements in performance. This finding is consistent with other research findings (Barratt and Barratt, 2012).

Many authors agree that the implementation of an advanced technology does not necessarily guarantee improved internal company integration and high benefits (Wu *et al.*, 2006; Fawcett *et al.*, 2009; Mishra *et al.*, 2013). The empirical findings showed that the implementation of ERP was not considered in itself as a facilitator of integration and it needed to be supported by internal actors' integration and sharing of accurate information in order to produce high information integration. This is consistent with previous literature (e.g. Fawcett *et al.*, 2009; Prajogo and Olhager, 2012; Mishra *et al.*, 2013) who found that the investment in technology for information sharing needs to be supported with a collaborative culture in order to achieve the benefits sought.

The empirical investigation showed that when the technological integration was found to interact with the company embedded relationship it appeared to develop a social complexity that created a resource that was difficult to copy. The competitive advantage created from using the information sharing systems and communication tools also may diminish over time (Mishra *et al.*, 2013). According to RBV, when the technological implementation is combined with a company collaborative culture, a resource that is

difficult to duplicate is created. As a result, this resource holds the potential for achieving a competitive advantage (Barratt and Oke, 2007; Fawcett *et al.*, 2009).

7.2.2 External Supplier Integration

External supplier integration was defined as the degree to which a manufacturer builds a close relationship and collaborates with its external suppliers to seamlessly manage the flows of material and information, and enhances the value for the benefit of the relationship. Many previous studies supported the importance of external supplier integration for achieving supply chain integration (Ragatz *et al.*, 1997; Rosenzweig *et al.*, 2003; Devaraj *et al.*, 2007; Zhao *et al.*, 2011). For instance, Ragatz *et al.* (1997) found that external integration represented by suppliers' integration is essential for manufacturers to achieve improvements that maintain their competitiveness. Their finding was also reinforced by the findings from Rosenzweig *et al.* (2003) and Schoenherr and Swink (2012) who emphasised the role of supplier integration in internalising of resources. Devaraj *et al.* (2007) found that external supplier integration improved operational performance. The seminal work of Frohlich and Westbrook (2001) describing the 'arcs of integration' introduced five classifications for the manufacturer's degree of downstream and upstream integration in the supply chain. Their study's findings suggested that the greater the degree of integration with the downstream customers and upstream suppliers the better is the performance improvements. However, some other studies contradicted this view and found that it is not necessarily that external supplier integration is needed in the supply chain. For instance, Das *et al.* (2006) highlighted some costs related to integrating with suppliers, such as the costs of coordination, compromise and inflexibility. Cousins and Menguc (2006, p616) argued that despite the potential benefits of supply chain integration "...it also has costs and may not enhance the supplier's operational performance". Bask and Juga (2001) argued that intensive integration is not necessarily the best solution in all cases. The empirical findings from Flynn *et al.* (2010) based on supply chain integration in the cultural context of China suggested that external supplier integration did not improve operational and business performance.

However, the empirical findings from the case study research showed that there was limited external supplier integration in all cases. In order to gain a greater understanding of how the empirical findings relate to the previous literature, the findings from the main constructs of external supplier integration are discussed. The external supplier

integration components that were constructed in the theoretical framework from the literature are supplier actors' integration, supplier information integration, supplier material integration and supplier technological integration. These components of external supplier integration will lead the discussion of this level of integration.

- **Supplier Actors Integration**

Supplier actors' integration was defined from the literature as the degree to which the manufacturers and their major suppliers are managing their relationships closely based on mutual understanding. The empirical findings from the case study research showed that the focal companies did not have close relationships based on mutual understanding with their suppliers. The relationship appeared to be limited to performing the day-to-day business transactions and there was infrequent interaction between most of the focal companies and their suppliers. This is inconsistent with the theoretical basis of integration which suggests that close relationships based on mutual understanding are essential for a successful implementation of supply chain integration (Flynn *et al.*, 2010; Zhao *et al.*, 2011). Zhao *et al.* (2011) found that relationship commitment to both customers and suppliers is important to external integration between trading partners. The findings of Rosenzweig *et al.* (2003) suggested that the knowledge and expertise gained from suppliers through close relationships were necessary for achieving improvements in design and the overall performance of the supply chain. The lack of regular interaction and close relationships between the focal companies and their suppliers resulted in limited information visibility. This is consistent with the research findings from Barratt and Oke (2007) and Kocoglu *et al.* (2011) who found that close relationships with suppliers based on mutual understanding are essential for producing high information visibility.

The empirical findings suggested that the communication difficulty because of language difference appeared to be an issue for the focal companies in building closer relationships with their Far Eastern suppliers. This resulted in sharing limited and relatively inaccurate information which appeared to contribute to the limited visibility between the focal companies and their suppliers. Although the literature of supply chain integration confirmed the importance of relationships with suppliers, the issue of communication difficulty because of language was not evident in the previous empirical research on supply chain integration.

Inter-firm relationships have been viewed in literature as a means to access external resources (Cousins and Menguc, 2006; Lavie, 2006; Lewis *et al.*, 2010). Several previous studies argued that the close relationships that develop over time based on mutual understanding create capabilities that are difficult to duplicate (Rosenzweig *et al.*, 2003; Barratt and Oke, 2007; Chen *et al.*, 2009a). The lack of close long-term relationships between the five focal companies and their suppliers was not seen as resource that could not be easily copied by competitors.

- **Supplier Information Integration**

Supplier information integration was defined from the literature as the degree to which the manufacturers and their suppliers share high quality information that produces visibility for the relationship. The empirical findings showed that there was little information sharing between the focal companies and their suppliers as there was a lack of appreciation of the benefits to be gained from information sharing. This is inconsistent with the majority of previous studies (Kim *et al.*, 2011; Prajogo and Olhager, 2012; Williams *et al.*, 2013) who found that information sharing with suppliers is vital in the supply chain. This limited sharing of information was found to create limited information visibility between the focal companies and their suppliers. This is consistent with the theoretical definition of information visibility which suggests that information visibility is an outcome of the intensive sharing of high quality information (Barratt and Oke, 2007; Porasmaa and Ojala, 2011; Williams *et al.*, 2013; Caridi *et al.*, 2014).

The lack of regular information sharing in the case studies was linked to the lack of willingness of the focal companies and their suppliers to achieve higher visibility. This finding reinforced the findings from Fawcett *et al.* (2009) who showed that companies first need to show understanding regarding the importance of information sharing and desire to achieve visibility with their partners. The empirical findings showed that the limited information visibility between the focal companies and their suppliers impacted negatively on achieving supplier material integration, inefficient stock control of fabric seen in the frequent stock-outs and excessive obsolete fabric (Caridi *et al.*, 2014). Previous literature found that information visibility is essential for achieving efficient inventory control (Lee *et al.*, 1997; Strader *et al.*, 1999; Lee *et al.*, 2000; Saldanha *et al.*, 2013; Mishra *et al.*, 2013).

Information integration with external partners can create capabilities that are potential sources of competitive advantage for the firm (Lorenzoni and Lipparini, 1999; Rungtusanatham *et al.*, 2003). Hoyt and Huq (2000) argued that the efficient information flow can support generating a sustainable competitive advantage. As supplier information integration, based on the findings from the case study research, did not provide great value for the relationship corresponding with RBV theory, this resource appeared not to be rare or have characteristics that are difficult to duplicate by competitors. Supplier information integration was not seen as inimitable in any case as there was nothing such as real-time access to information that was supported by actors' integration that would create a difficult to imitate resource.

- **Supplier Material Integration**

Supplier material integration was defined from the literature as the degree to which the manufacturers and their suppliers collaborate in managing the material flow between each other through standardised procedures and close coordination. The empirical findings showed that the importance of closely coordinating the material flow with suppliers was not well understood in most cases. The understanding of the focal companies and their suppliers of material integration was limited to the shipping of goods through international carriers. This finding is inconsistent with the theory of supplier material integration where the close coordination of material in an efficient and effective way plays a key role in achieving supply chain integration (Stock *et al.*, 2000; Rai *et al.*, 2006; Chen and Paulraj, 2004a; Prajogo and Olhager, 2012).

The empirical investigation suggested that there were no inventory management initiatives or a real-time access to material details between the focal companies and their suppliers. Previous studies argued that supplier material integration is characterised by increased computer and interpersonal logistics-related communication with the suppliers (Kim *et al.*, 2011), higher coordination of logistics activities between the supply chain partners, and blurred organisational distinctions between the logistics activities of the supply chain partners (Stock *et al.*, 2000; Chen and Paulraj, 2004a). A well-coordinated flow of material enables firms to deliver products to end customers in a timely, efficient and effective way (Deveraj *et al.*, 2007). Firms have implemented several practices and initiatives for synchronising the flow of material with their suppliers and customers (Daugherty *et al.*, 1996; Pagh and Cooper, 1998; Yao *et al.*,

2007; Saldanha *et al.*, 2013). For example, through supplier's participation in managing customers' inventory firms have gained advantages in reducing the possibility of stock shortage and overage and improving forecasting such as implementing VMI collaboration initiative (Yao *et al.*, 2007; Saldanha *et al.*, 2013; Lee and Cho, 2014). However, such initiatives were not evident in the case study research. The empirical findings showed that the lack of regular sharing of material details produced limited information visibility which appeared to restrict achieving higher supplier material integration (Mishra *et al.*, 2013). The lack of material information visibility resulted in frequent changing of shipping mode, variance in on-time delivery and a lack of confidence in the order status. This reinforces the empirical findings from Deveraj *et al.* (2007) who found that sharing material details with suppliers is essential for achieving improvements in on-time delivery.

Material integration with external partners can create capabilities that are potential sources of competitive advantage (Chen *et al.*, 2009a). As the empirical findings suggested that supplier material integration did not provide great value for the relationship corresponding with RBV theory, this resource appeared not to be rare or have characteristics that are difficult to duplicate by competitors. Supplier material integration was not seen as inimitable in any case as there were no activities such as close coordination of material flow that was supported by actors' integration that would create a difficult to imitate resource.

- **Supplier Technological Integration**

Supplier technological integration was defined from the literature as the degree to which the manufacturers are technologically connected with their major suppliers through information sharing systems and communication tools that facilitate information visibility in the relationship. The technological connection through dedicated information sharing systems between the focal companies and their suppliers was not evident from the case study research. This is inconsistent with the theory of supplier technological integration which suggests that the integration of information technology facilitates the flow of information between the firms occupying different positions across the supply chain (Vickery *et al.*, 2003; Chen and Paulraj, 2004a; Rai *et al.*, 2006; Wu *et al.*, 2006; Kim *et al.*, 2011). The findings from the case study research indicated

that there was technological connection with suppliers only through communication tools and particularly through email. The focal companies were similar in that they did not have the desire as to understand the importance of implementing information sharing systems with suppliers. The lack of information sharing systems and dependence on email communication did not support providing high quality information. This was mainly due to the lack of real-time access to information between the focal companies and their suppliers. Previous research found that the high cost of implementation and the lack of confidence in information sharing with other supply chain members make the firms resistant to invest in technological integration in the supply chain (Wu *et al.*, 2006). Literature maintained that the lack of technological integration restricts achieving efficient information flow and coordination of material flow activities (Rai *et al.*, 2006; Kim *et al.*, 2011; Saldanha *et al.*, 2013). Previous empirical research found that using information sharing systems that provide a real-time access to information provided operational improvements in terms of smoothing information and material flows (Kocoglu *et al.*, 2011; Kim *et al.*, 2011).

The empirical evidence also showed that information sharing by email did not produce high quality information as it contained far too much information that was not easily understood. Moreover, it did not provide information visibility between the focal companies and their suppliers. The empirical investigation of Barratt and Oke (2007) showed that the information shared with suppliers via email provided operational improvements. However, they concluded that the email did not facilitate the sharing of information that would produce high visibility. The empirical investigation of Barratt and Barratt (2012) showed that email was a useful tool for information sharing with suppliers; however, it did not result in significant improvements. Several studies showed that the internet-based applications are vital for the integration with external partners (Frohlich and Westbrook, 2002; Rosenzweig *et al.*, 2003). However, these applications do not produce real-time access to information nor do they facilitate the high visibility (Saldanha *et al.*, 2013) that would produce competitive advantage (Paulraj *et al.*, 2008).

There was also occasional use of the phone by all of the focal companies for communication with their suppliers. Three of the companies also used conference calls and videos mainly through infrequent Skype calls for connecting with their suppliers. The fax was also used occasionally for sharing documents such as invoices and shipping

documents with their suppliers. However, such documents were shared via email in all cases. These communication tools were seen as useful to facilitate the sharing of information with suppliers. However, their use did not seem to provide information visibility with suppliers (Barratt and Oke, 2007).

Wu *et al.* (2006) suggested that well-integrated technology with partners creates firm-specific capabilities that are difficult to imitate. Such technological connections have the potential for achieving a competitive advantage as a result of the high information visibility they create (Saldanha *et al.*, 2013). The lack of information sharing systems and the limited benefits gained from the email communication between the focal companies and their suppliers did not seem to create rare capabilities that are difficult to imitate. Therefore, supplier technological integration did not appear to have the potential for achieving a competitive advantage.

7.2.3 External Customer Integration

External customer integration was defined as the degree to which a manufacturer builds a close relationship and collaborates with its external customers to seamlessly manage the flows of material and information, and enhance the value for the benefit of the relationship. The empirical evidence suggested that external customer integration was evident in most cases. This is consistent with the theory of integration which suggests that there is a need for external customer integration for a successful supply chain integration implementation (Stank *et al.*, 2001; Frohlich and Westbrook, 2001; Van der Vaart and Van Donk, 2008; Zhao *et al.*, 2008). The empirical findings showed that the impact of external customer integration was improved production capacity planning, improved service level and responsiveness. Some of these findings are consistent with the research findings from Lummus and Vokurka (1999) who reported benefits for external customer integration in terms of holding fewer inventories and reduction in logistics costs and better response to customer requirements. The empirical findings from Schoenherr and Swink (2012) reinforced the importance of external customer integration for acquiring resources for the benefit of the relationship. The empirical findings from Flynn *et al.* (2010) suggested that external customer integration was related to both operational and business performance. However, their investigation of supply chain integration was across 13 different industries in the context of China and

did not consider a specific industry. Conversely, Devaraj *et al.* (2007) found that customer integration did not improve operational performance. The empirical findings of Danese and Romano (2011) suggested that it is not necessarily that customer integration improves operational performance in terms of efficiency.

In order to gain a greater understanding of how the empirical findings relate to the previous literature, the findings from the main constructs of external customer integration are also discussed. The external customer integration components that were constructed in the theoretical framework from the literature are customer actors' integration, customer information integration, customer material integration and customer technological integration. These components of external customer integration will lead the discussion of this level of integration.

- **Customer Actors Integration**

Customer actors' integration was defined from the literature as the degree to which the manufacturers and their major customers are managing their relationships closely based on mutual understanding. The empirical evidence from the case study research showed that the focal companies managed the relationship with their customer closely. The close relationship that was created through dedicated customer service and regular interaction resulted in improved customer satisfaction. This finding is consistent with previous literature (Homburg and Stock, 2004; Barratt and Oke, 2007; Flynn *et al.*, 2010). Regular interaction and close relationships were found to be vital for improving the level of information visibility with customers seen in the improved capacity planning, responsiveness to customers' requirements. This corroborates with Barratt and Oke (2007), Kocoglu *et al.* (2011) and Barratt and Barratt (2012) who found that close relationships improve the level of visibility in the supply chain. The impact of dedicated customer service on the relationship was greater when there was customised customer service for each function such as delivery, quality and sourcing. Barratt and Barratt (2012) also found that dedicated customer service contributed to building a stronger relationship and improved the level of information visibility.

The empirical findings from the case study research suggested that the long relationship duration with customers produced an embedded relationship resulting in higher levels of mutual understanding. Squire *et al.* (2009) argued that the embedded relationship that develops over time make the actors feel secure in the relationship. Mutual

understanding appeared to be a key factor in managing the relationship between the five focal companies and their customers and the relationship was expected to continue for the coming years with customers. Literature strongly supported the importance of mutual understanding as essential elements of successful supply chain integration (Lee *et al.*, 1997; Chen and Paulraj, 2004b; Kwon and Suh, 2005; Zhao *et al.*, 2008; Zhao *et al.*, 2011). Zhao *et al.* (2008) found that relationship commitment to customers has a direct impact on improving customer integration in the supply chain. A later study by Zhao *et al.* (2011) found that relationship commitment to customers is important to external integration between trading partners.

Customised customer service created a close relationship and higher flexibility which supported producing higher visibility. This produced a socially complex relationship that appeared to be difficult to imitate. The history-dependent relationships that were built over time based on mutual understanding were seen as difficult to imitate. This corroborates with the idiosyncratic nature of the firm relationships (Zhao *et al.*, 2011) with customers which makes the imitability difficult (Grant, 1996; Lorenzoni and Lipparini, 1999).

- **Customer Information Integration**

Customer information integration was defined from the literature as the degree to which the manufacturers and their customers share high quality information that produces visibility for the relationship. The empirical evidence showed that there was regular sharing of information between the focal companies and their customers. This is consistent with theory of integration which emphasises the importance of information sharing with customers for a successful implementation of external customer integration (Kocoglu *et al.*, 2011; Williams *et al.*, 2013). The empirical findings also supported the importance of sharing high quality information in order to produce higher operational benefits (Deveraj *et al.*, 2007; Kocoglu *et al.*, 2011; Porasmaa and Ojala, 2011; Williams *et al.*, 2013). The information shared between the trading members needs to enjoy qualities including being trustworthy, timely, meaningful and accurate in order to produce visibility for the supply chain (Barratt and Oke, 2007; Towers and Burnes, 2008; Porasmaa and Ojala, 2011; Williams *et al.*, 2013). Therefore, it is the quality of information being shared that creates information visibility rather than solely information sharing.

It was not possible for the focal companies to achieve improvements in capacity planning, the level of on-hand inventory and facilitate material flow without exchanging high quality information with their external customers. The empirical findings also suggested that the information visibility achieved as a result of the frequent sharing of high quality information was higher when there was regular interaction through customised dedicated customer service and close relationships with customers. The recent literature has emphasised the importance of close relationships with customers in supporting the role of information sharing in achieving higher levels of visibility (Kocoglu *et al.*, 2011; Barratt and Barratt, 2012).

On the contrary, the lack of sharing of frequent and high quality information with customers at two of the five focal companies resulted in poor capacity planning and ineffective material flow. For instance, the lack of forecast-related information sharing and visibility was dealt with by stocking fabric in anticipation of future demand. This resulted in excess out-of-fashion fabric held in stock and frequent stock-outs of particular types of fabric. This impacted on meeting customers' requirements and increased waste in the utilisation of the internal production resources for the focal company. Previous research strongly supports the negative impact of sharing low quality information on achieving improved visibility (Barratt and Oke, 2007).

Consistent with Lorenzoni and Lipparini (1999), Hoyt and Huq (2000) and Rungtusanatham *et al.* (2003), the findings suggested that information sharing created a visibility that is seen as difficult to imitate. According to RBV, a high level of visibility can be seen as a capability that is a potential source of competitive advantage (Barratt and Oke, 2007). The findings corroborate with recent literature in that the regular interaction and close relationships based on mutual understanding created a higher level of visibility (Kocoglu *et al.*, 2011; Barratt and Barratt, 2012) that is more difficult to imitate as it creates a level of social complexity (Barratt and Oke, 2007).

- **Customer Material Integration**

Customer material integration was defined from the literature as the degree to which the manufacturers and their customers collaborate in managing the material flow between each other through standardised procedures and close coordination. The empirical evidence suggested that customer material integration was evident in most cases. This is consistent with the theory of integration which suggests that customer material

integration is a key element for achieving supply chain integration (Stock *et al.*, 2000; Frohlich and Westbrook, 2001; Stank *et al.*, 2001; Chen and Paulraj, 2004a; Prajogo and Olhager, 2012). The empirical findings suggested that the regular sharing of material information between the focal companies and their customers seemed to improve the level of material integration. This is consistent with the research from Frohlich and Westbrook (2001), Deveraj *et al.* (2007) and Mishra *et al.* (2013). On the contrary, the lack of regular sharing of material details and the limited visibility seen in one of the companies seemed to impact on the material integration with its customers.

The high level of customer actors' integration appeared to impact on achieving higher levels of customer material integration. The focal companies in the case study research regularly updated their international customers on the order status. Any delays in despatching orders were discussed with the customers. The companies who had a close relationship with their customers were able to avoid the customers' delay penalties when despatching orders. Therefore, the close relationship with customers was found to facilitate efficient material flow as shown by the empirical research from Prajogo and Olhager (2012).

Customer material integration resulted in accumulating knowledge through the standardised shipping procedures and the skill set that customers had in managing material flow. This is similar to what Lavie (2006) referred to as inbound spillover rents where the garment manufactures were able to benefit from the unintended capabilities of their international customers (Jia and Lamming, 2013). The standardisation of procedures in the transference of goods was found to be consistent with the RBV theory for producing a competitive advantage. Such integration "can create combinations of unique skills, knowledge, and joint capabilities" (Schoenherr and Swink, 2012, p101). When trading partners work closely in a synchronised way, this leads them to acquire transaction-specific know-how (Grant, 1996). Such efforts may create a capability that is difficult to replicate by competitors (Rosenzweig *et al.*, 2003; Chen *et al.*, 2009a) and improve efficiency and coordination (De Vita *et al.*, 2011).

- **Customer Technological Integration**

Customer technological integration was defined from the literature as the degree to which the manufacturers are technologically connected with their major customers through information sharing systems and communication tools that facilitate

information visibility in the relationship. The importance of technological integration for achieving customer integration was evident in the empirical findings seen in facilitating the sharing of information which produced improved information visibility. This is consistent with the theory of integration which suggests that customer technological integration is essential for a successful implementation of supply chain integration (Rai *et al.*, 2006; Prajogo and Olhager, 2012; Mishra *et al.*, 2013). The empirical findings suggested that the technological adoption of EDI was necessary for facilitating customer integration. This is consistent with the empirical research from a large number of previous studies (e.g. Rosenzweig *et al.*, 2003; Mishra *et al.*, 2013). Conversely, Deveraj *et al.* (2007) found that an EDI connection does not provide high benefits to the supply chain comparing to the more integrated technologies that provide a comprehensive order-processing capabilities. The technological adoption of EDI was not considered as a facilitator of customer integration in itself and it needed to be supported by actors' integration and sharing accurate information. This finding supports the view of previous literature which found that information sharing technology in itself would not produce performance improvements (Fawcett *et al.*, 2009; Prajogo and Olhager, 2012; Saldanha *et al.*, 2013; Mishra *et al.*, 2013). For instance, Fawcett *et al.* (2009) found that the information sharing technology needs to be combined with a willingness to make the information available by the supply chain partners in order to produce improved performance. Paulraj *et al.* (2008) found that the mere investment in IT does not produce competitive advantage. Rather, it needs to be coupled with effective communication and close relationships between the buyer firms and their suppliers.

The empirical evidence showed that information sharing through email and other communication tools such as phone, conference calls and fax did not allow sharing of information in an easy-to-understand format. Moreover, it did not provide information visibility between the focal companies and their customers. The empirical research from Barratt and Oke (2007) suggested that the information shared via these communication tools provided operational improvements. However, they concluded that the email did not facilitate the sharing of information that would produce high visibility. Previous studies (Frohlich and Westbrook, 2002; Rosenzweig *et al.*, 2003) suggested that internet-based applications are vital for the integration with external partners. However,

these applications do not produce a real-time access to information and high visibility (Saldanha *et al.*, 2013).

The empirical findings suggested that where the resource created as a result of customer technological integration was found to be rare there was willingness to share information and high actors' integration. The inimitability of customer technological integration was found to be connected with the collaborative behaviours that existed in the relationship and high confidence of the shared information. This corroborates with Fawcett *et al.* (2009) who found that when the willingness to share information is embedded in the organisational culture of the firm, a rare resource is created that might produce a competitive advantage. However, this contradicts the research of Wu *et al.* (2006) who found that the well-integrated technology in itself creates firm-specific capabilities that are difficult to imitate.

7.3 Interrelationships between Internal and External Supply Chain Integration

The empirical findings from this case study research suggested that external customer integration was necessary for reaping higher benefits from internal company integration. Internal company integration was interpreted in the theoretical supply chain integration framework in terms of internal actors' integration, internal information integration, internal material integration and internal technological integration. The empirical findings suggested that the garment manufacturers were not able to successfully implement internal company integration when there was a lack of external customer integration. For instance, the benefits reaped from internal actors' integration efforts were limited as the production and supporting functions built their joint-planning based on limited understanding of what is happening with their customers. This is partly because of the lack of technological connection but also the limited face-to-face interaction between the focal companies and their customers. The lack of external customer integration also affected negatively on achieving internal information integration as the focal companies shared relatively low quality information internally which resulted in clear capacity planning inefficiency and production disruption. The benefits reaped from internal material integration efforts were also limited as internal material flow was managed based on limited understanding of the current customers' orders and needs as seen from the case study analysis. The lack of external customer

integration also resulted in limited benefits from using the ERP system. Although the ERP system allowed the production and supporting functions to access information on a real-time basis, this information was of low quality as it was based on limited and low information quality from customers.

Conversely, the focal companies who had external customer integration were able to successfully implement and reap higher benefits from their internal company integration efforts. The production and supporting functions built their meetings and joint planning based on full sharing of high quality information with their customers. Similarly, the elements of information integration, material integration and technological integration were found to effectively contribute to the successful implementation of internal company integration in the context of improved external customer integration.

Previous studies suggested that internal integration is a prerequisite for achieving successful external integration (Vickery *et al.*, 2003; Chen *et al.*, 2009a; Zhao *et al.*, 2011; Schoenherr and Swink, 2012; Williams *et al.*, 2013). Williams *et al.* (2013) found that internal company integration is a vital element for achieving external integration. Schoenherr and Swink (2012) stated that internal company integration is a major component for achieving supply chain integration that leads to improved organisational performance. Zhao *et al.*, (2011) argued that internal integration has a direct positive impact on external integration. Flynn *et al.* (2010, p67) found that “internal integration forms the foundation upon which customer and supplier integration builds...and provides a vital link between customer integration and supplier integration, without which companies are unable to reap the full benefits of their supply chain integration efforts”. However, the impact of external integration on internal company integration was not understood in previous literature. In contradiction to the empirical findings of this thesis, Flynn *et al.* (2010, p64) found that “neither supplier integration nor customer integration moderated the relationship between internal integration and operational performance.” Gimenez and Ventura (2005) found that internal company integration and external customer integration influence each other and that external customer integration and the internal functional areas that are integrated impacts the performance of internal integration. However, their study focused on the fast-moving consumer goods (FMCG) in Spain and they studied internal company integration in terms of dyadic interface between logistics-marketing and logistics-production. Moreover, their study viewed external integration in terms of customer integration in their definition of

external integration and they did not consider supplier integration. Williams *et al.* (2013) found that external customer integration provided high value for internal company integration. However, their view of external customer integration was limited to information integration.

7.4 The Developed Empirical Model of Supply Chain Integration

The theoretical supply chain integration framework (Figure 3.5 in Chapter 3) that was developed from the literature will be adapted based on the empirical analytic generalisations from the case study research. The adaptations of the original framework are shown in highlighted *italic* in Figure 7.1 below.

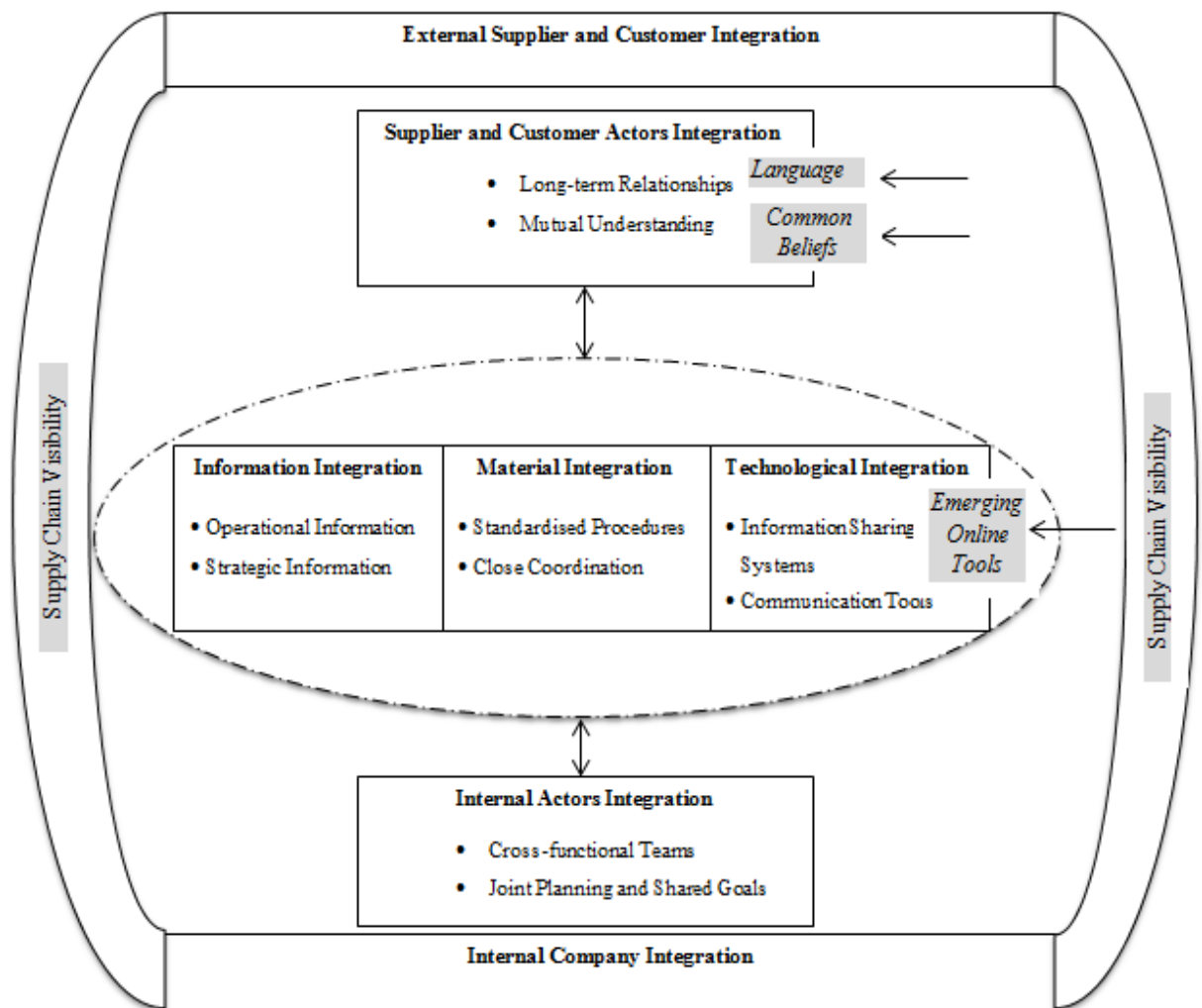


Figure 7.1: The developed empirical supply chain integration model

The modified components relate to the external supplier and customer integration. Particularly, this was related to supplier and customer actors' integration and

technological integration. The empirical findings suggested that the emerging online communication tools were used by the focal companies to improve information sharing. Therefore, this element was added to the empirical model. The empirical findings also suggested that the focal companies had communication difficulties because of language difference which restricted achieving higher levels of actors' integration. Therefore, language was added to the empirical model. The empirical findings showed that there was a conflict between the beliefs of the focal companies and their suppliers on how the relationship in the supply chain should be managed. Therefore, the alignment of common beliefs was also added to the empirical model. Moreover, the concept of supply chain visibility was added to the empirical model. Whereas the theoretical framework developed in Chapter 3 defined supply chain visibility as information integration and technological integration, the developed empirical model defined visibility in terms of supply chain integration within the firm and externally with suppliers and customers. These modifications are discussed in detail.

- **The Emerging Instant Online Communication Tools**

The emerging instant online communication tools such as Skype, Tango and Viber were found to be of importance for facilitating information sharing. External customer integration was interpreted in the theoretical supply chain integration framework in terms of customer actors, information, material and technological integration. Customer technological integration was viewed in terms of using information sharing systems and communication tools. However, the empirical findings provided evidence that the emerging online communication tools were also necessary for facilitating information sharing in the supply chain. The empirical findings showed that the focal companies have benefited from the emerging online communication tools for enabling information sharing with suppliers and customers. The focal companies and their customers found these communication tools handy and cheap. These tools were also viewed as useful for sharing product samples through the photo sharing features.

Communication tools such as email, phone and fax are viewed in literature as a facilitator of information sharing with the supply chain members (Barratt and Barratt, 2012). However, the introduction of instant online communication tools that can also be readily used in Smart Phones provided an additional option for communication. These

tools were found to be more important to those companies who had customers classified as small-sized retailers. Such retailers were not able to invest in expensive technologies that offer a real-time access to information. Therefore, they found these technologies easy-to-use and inexpensive compared to the highly integrated technologies and traditional communication tools of phone and fax. Thus, the emerging online communication tools were added to the elements of suppliers and customers' technological integration in the developed empirical supply chain integration model.

- **Language**

Communication difficulty because of language difference appeared to be an issue for Jordanian manufacturers in integrating with most of their suppliers. External supplier integration was interpreted in the theoretical supply chain integration framework in terms of supplier actors, information, material and technological integration. Supplier actors' integration was viewed in terms of building close relationships that are based on mutual understanding. However, the empirical findings showed that the focal companies and their suppliers were not able to achieve higher levels of actors' integration because of the language difference. This also impacted on the limited mutual face-to-face visits between the focal companies and their suppliers. Some focal companies arranged interpreters when they visited their suppliers in order to facilitate the communication. However, the language problem also affected the quality of information shared between the focal companies and their suppliers. The empirical findings showed that the misunderstanding resulted in perceiving the operational information inaccurately and as a result shipping incorrect raw materials from the suppliers to the focal companies. Conversely, the focal companies did not appear to have difficulties because of the language difference with their international customers who are mainly based in the USA, Turkey and Italy. Therefore, the problem of language difference appeared to be an issue with the Far Eastern suppliers.

Previous literature supported the importance of mutual understanding for a successful implementation of supply chain integration. However, literature did not specify what aspects of mutual understanding are essential for achieving supply chain integration. Although language was previously considered in literature as a requirement for organisational relationships (e.g. Homburg *et al.*, 2002; Yan and Dooley, 2013), this has

not been empirically found to be a component for a successful implementation of supply chain integration. Thus, language was added to the elements of supplier and customers actors' integration in the developed empirical supply chain integration model.

- **The Alignment of Common Beliefs**

The lack of alignment of common beliefs between the focal companies and their suppliers was found to restrict achieving higher external supplier integration. External supplier integration was interpreted in the theoretical supply chain integration framework in terms of supplier actors, information, material and technological integration. Supplier actors' integration was viewed in terms of building close relationships that are based on mutual understanding. The empirical findings showed that there was a conflict between the beliefs of the focal companies and their suppliers about how the relationship in the supply chain should be managed. The focal companies' view was that the relationship should be managed based on regular mutual visits, higher confidence in the partner and increased socialisation. However, the suppliers' belief was that socialisation and the frequent mutual visits are not essential for having a successful relationship in the supply chain. This conflict in beliefs was found to restrict achieving higher levels of external integration.

Previous literature supported the importance of mutual understanding for a successful implementation of supply chain integration. However, literature did not specify what aspects of mutual understanding are essential for achieving supply chain integration. Although the alignment of common beliefs was studied in literature as a requirement for organisational relationships (e.g. Pagell *et al.*, 2005; Yan and Dooley, 2013; Ribbink and Grimm, 2014), this has not been considered as a component for a successful implementation of supply chain integration. Thus, the alignment of common beliefs was added to the elements of supplier and customer actors' integration in the developed empirical supply chain integration model.

- **The Developed Empirical Supply Chain Integration Model Informs Supply Chain Visibility**

Recent literature of operations and supply chain management has witnessed increased discussion of the concept of supply chain visibility (e.g. Barratt and Oke, 2007; Porasmaa and Ojala, 2011; Kim *et al.*, 2011; Caridi *et al.*, 2013; Williams *et al.*, 2013; Caridi *et al.*, 2014). This concept has been used in literature interchangeably with information visibility. The idea of visibility is focused on making information available to the trading partners on a real-time basis. Therefore, visibility was defined in the early development of the concept in literature as the sharing of information between the trading partners. However, recent literature has focused on the issue of quality of information shared in terms of its accuracy and timeliness (Caridi *et al.*, 2014). The need for considering the quality of shared information is not new in information sharing literature. The rationale for focusing on the quality of information shared is to ensure that the trading partners have access to information that is meaningful and can be used for improved decision making. Literature also supported the role of inter-organisational information sharing systems in facilitating information visibility in the supply chain (e.g. Kim *et al.*, 2011). Another stream of literature considered the role of close relationships between the trading members in order to produce higher levels of visibility (e.g. Barratt and Oke, 2007; Kocoglu *et al.*, 2011). The argument is that the increased levels of integration between the actors based on mutual understanding facilitate producing higher visibility (Barratt and Oke, 2007).

The findings of this thesis suggest that the empirical supply chain integration model developed informs the subject of supply chain visibility. The argument is that when the major constructs of actors, information, material and technological integration at the three levels of supplier, customer and internal integration are considered in totality, higher levels of supply chain visibility can be achieved. Therefore, achieving supply chain visibility should not be limited to achieving high quality information sharing (e.g. Caridi *et al.*, 2011; Williams *et al.*, 2013), actors' integration (e.g. Barratt and Oke, 2007; Kocoglu *et al.*, 2011) and technological integration (e.g. Kim *et al.*, 2011), but also through close coordination and standardised procedures of material flow between the supply chain members. The clearly identified instructions for the transfer of goods and the management of inventory (standardised procedures), and the involvement of

personnel and the use of enabling technology (close coordination) in the case study research were found to facilitate producing higher levels of visibility in the supply chain.

Furthermore, achieving high supply chain visibility should not be limited to external visibility with the supply chain partners but also internal visibility amongst the production and supporting functions. Previous literature has viewed supply chain visibility as an inter-organisational concept and neglected the role of internal visibility. The empirical findings of this thesis supported the role of both internal visibility and external visibility with suppliers and customers. Therefore, achieving improved visibility departs from the narrow focus on the regular sharing of meaningful information to the wider focus of viewing visibility as an outcome of integration across the supply chain.

Studying supply chain integration across the three levels of supplier, customer and internal integration allowed the development of a comprehensive model for garment manufacturers. Without this approach of studying integration at three levels across the supply chain and conducting case study research based on evidence collected from suppliers, manufacturers and customers, the construct of visibility would not have evolved from the empirical model.

7.5 Chapter Summary

This chapter discussed the empirical findings from the case study analysis in the context of extant literature. The purpose was to adapt the theoretical framework developed from literature based on the empirical analytic generalisations from the case study research. As a result, a novel empirical supply chain integration model that underpins competitive advantage for garment manufacturers serving international customers was developed. Issues concerning communication difficulty, common beliefs and emerging online tools were discussed as new components of the supply chain integration model. The empirical model also provided insights into the subject of supply chain visibility and a greater understanding of the interrelationships between the levels of integration. Having developed this empirical model, the next chapter will address the research objectives of this thesis, summarise the contribution of the thesis to knowledge, and introduce directions for future research.

8. Conclusions

This chapter addresses the research objectives based on the empirical findings from the across case study analysis. It also explains the practical implications through proposing recommendations to decisions makers in Jordan and the managers who participated in this case study research. The chapter presents the research limitations and finally, some directions for future research in the area of supply chain integration and supply chain visibility are introduced.

8.1 Revisiting Research Objectives

The research objectives identified in the literature review will be addressed in this section. Whereas the first objective was theoretical and was addressed based on the detailed literature review, the other two objectives were empirical and were investigated through conducting a case study research. The three research objectives are addressed below.

8.1.1 Research Objective 1: To develop a theoretical framework for integrating manufacturers' internal functional departments with their external supply chain suppliers and customers.

This objective was addressed in Chapter 3 (see Figure 3.5) through synthesising supply chain integration constructs based on the detailed literature review. The need for developing this framework emerged from the disagreement in literature on the components and levels of supply chain integration (Fabbe-Costes and Jahre, 2008; Schoenherr and Swink, 2012; Gimenez *et al.*, 2012; Zhang and Huo, 2013). The proposed theoretical supply chain integration framework comprised external supplier and customer and internal company integration. This is a novel view of supply chain integration as previous studies have traditionally focused on studying external integration and internal integration separately. Moreover, most previous research did not distinguish between supplier integration and customer integration in their view of external integration. This theoretical framework differentiates between the integration components that are related to supply chain flows and the integration components that are related to relationship integration. This has been considered through using mutual components of internal and external integration that reflect the boundary-spanning

nature of supply chain management (information, material and technological integration). Meanwhile, it introduces internal and external relationships (actors' integration) as two separate constructs to stress that managing relationships is different at the firm level from across the supply chain.

8.1.2 Research Objective 2: *To empirically investigate how the supply chain integration levels are interrelated.*

The empirical findings of this research suggested that external customer integration was necessary for reaping higher benefits from internal company integration, while external supplier integration did not impact on internal company integration. This contradicts recent research that found it is internal company integration that improves external integration (e.g. Flynn *et al.*, 2010; Zhao *et al.*, 2011; Schoenherr and Swink, 2012) and that external integration did not support internal company integration (e.g. Flynn *et al.*, 2010). Moreover, most of these studies did not specify what levels of external integration are improved. However, the findings of this thesis suggest that internal company integration is necessary for achieving external customer integration but internal company integration efforts will not result in high benefits without achieving external customer integration. Thus, the thesis proposed that manufacturers need to first have the structure of both internal company integration and external customer integration and then achieve external customer integration in order to be able to reap higher benefits from internal company integration, see Figure 8.1.

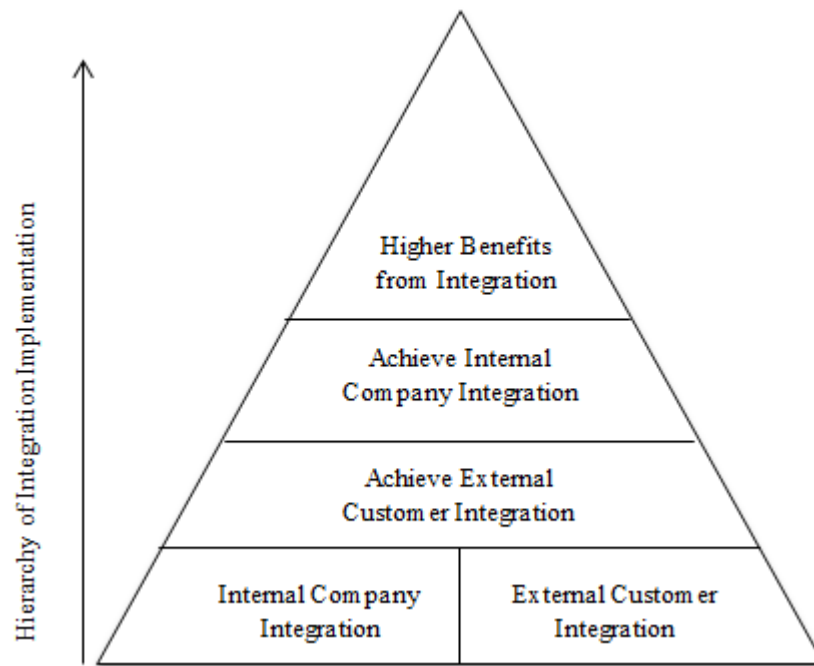


Figure 8.1: Achieving higher benefits from internal company integration

This is an important contribution to the ongoing debate on whether to include internal integration or not in the theory of supply chain integration. Moreover, this contribution addressed a recently called for question about the interrelationships between the levels of integration (Schoenherr and Swink, 2012; Gimenez *et al.*, 2012). Furthermore, the importance of this proposition is that it suggests that when supply chain integration was studied extendedly across suppliers, manufacturers and customers it allowed the interrelationships between levels of integration to be better understood. Practically, this finding is important to Jordan's garment manufacturers who are striving for improved competitive advantage with limited internal resources. Therefore, this finding was necessary in order to provide suggestions on maximising the benefits of their limited resources through understanding how to manage their integration efforts and increase the internalisation of external resources.

8.1.3 Research Objective 3: *To validate the theoretical framework in order to understand competitive advantage for garment manufacturers and their international suppliers and customers.*

This objective was addressed through developing an empirical supply chain integration model in Chapter 7 (see Figure 7.1). The developed empirical model is different from

previous models in literature in that it comprises three levels of supplier, customer and internal company integration and was developed based on using the supply chain as the unit of analysis. This model is specific to garment manufacturers serving international customers and is limited to the phenomenological context of the studied companies. The components of this model suggested that there is a need for a higher attention to the alignment of common beliefs and language for achieving successful supply chain integration. The model also suggested that there was evidence for the importance of the emerging online communication tools in supporting technological integration in the supply chain. It was also suggested that the empirical supply chain integration model developed informs the subject of supply chain visibility. The argument is that when the major constructs of actors, information, material and technological integration at the three levels of supplier, customer and internal integration are considered in totality, a higher level of supply chain visibility can be achieved. Therefore, achieving supply chain visibility should not be limited to achieving high quality information sharing (e.g. Caridi *et al.*, 2011; Williams *et al.*, 2013), actors' integration (e.g. Barratt and Oke, 2007; Kocoglu *et al.*, 2011) and technological integration (e.g. Kim *et al.*, 2011), but also through close coordination and standardised procedures of material flow between the supply chain members. Furthermore, achieving high supply chain visibility should not be limited to external visibility with the supply chain partners but also internal visibility amongst the production and supporting functions. Previous literature has viewed supply chain visibility as an inter-organisational concept and neglected the role of internal visibility. The empirical findings of this thesis supported the role of both internal company visibility and external visibility with suppliers and customers. This is an important finding as recent operations and supply chain management literature has witnessed increased discussion of the concept of supply chain visibility (e.g. Barratt and Oke, 2007; Porasmaa and Ojala, 2011; Kim *et al.*, 2011; Barratt and Barratt, 2012; Williams *et al.*, 2013; Caridi *et al.*, 2013; Caridi *et al.*, 2014).

Having addressed the three research objectives of the thesis, the next section summarises the contribution of the thesis to knowledge.

8.2 Contribution to Knowledge

The contribution of this thesis to knowledge is viewed in terms of contribution to theory, method, philosophy and practice.

8.2.1 Contribution to Theory

The vagueness of the concept of supply chain integration has inspired the theoretical contribution of this thesis. This research made a theoretical contribution through developing a theoretical supply chain integration framework which comprised external supplier and customer integration and internal company integration.

The thesis contributed to this framework and the theory development in supply chain management research through applying RBV across the three levels of external supplier, customer and internal company integration. Thus, this thesis makes a contribution in terms of reinforcing the establishment of RBV theory as a powerful paradigm for explaining the supply chain integration phenomenon. This research is the first to apply the RBV paradigm for explaining supply chain integration phenomenon comprising internal company integration, external supplier integration and external customer integration. Thus, the thesis fills a gap in our understanding of the way internal, upstream and downstream resources fit and interact with each other to generate even further resources and improve competitive advantage from an RBV perspective. Moreover, this thesis introduced an application of the RBV theory in Jordan's garment manufacturing industry supply chains. This is important to the development of the RBV theory in supply chain management research as there is a need for introducing new perspectives of this theory from different national contexts (Liu *et al.*, 2010) and industries (Rosenzweig *et al.*, 2003). Such efforts by integrating existing theories with new perspectives can make significant contributions to the operations and supply chain management field (Barratt *et al.*, 2011).

Another theoretical contribution of this thesis is represented by investigating the supply chain integration of garment manufacturers serving international customers. Recent research postulated the need in supply chain integration literature for the role of industry or product context to be considered (Van Donk and Van der Vaart, 2005; Flynn *et al.*, 2010; Gimenez *et al.*, 2012). Thus, this thesis added to the extant literature through studying supply chain integration of garment manufacturers whom their products are

classified as innovative (Wang and Chan, 2010; Caniato *et al.*, 2012; Perry and Towers, 2013).

Another contribution relates to the national context of the research and is represented by introducing case study research from a developing country such as Jordan. The relevance of the national context in studying supply chain integration has been raised by recent literature (e.g. Flynn *et al.*, 2010; Zhao *et al.*, 2011; Schoenherr and Swink, 2012; Liu *et al.*, 2013). Hence, this thesis filled a gap in literature through understanding the supply chain integration phenomenon in the garment industry from the perspective of a developing country such as Jordan. The manufacturing sector in Jordan was particularly relevant and important to this research due to its prominent contribution to the stability and growth of the Jordanian economy. The Jordanian context was unique in that the manufacturers depended completely on raw materials suppliers from outside the country. This is because of the lack of natural resources that made producing fabric and trim difficult in Jordan. This increased the complexity and made the supply chain more geographically extended.

This research also contributed to extant literature through introducing an empirically grounded supply chain integration model. This model is different from previous models in the literature in that it comprises three levels of supplier, customer and internal company integration and was developed based on using the supply chain as the unit of analysis. Although most of the individual components of the framework are not new, this is the first study to synthesise them in a single concept. For instance, information integration (Barratt and Oke, 2007), relationships integration (Cousins and Menguc, 2006), technological integration (Wu *et al.*, 2006) and material integration (Prajogo and Olhager, 2012) were studied in previous literature. However, studying these components at both internal and external firm levels from an RBV perspective is viewed as a novel contribution of this research.

This research made a theoretical contribution through providing empirical evidence on the interrelationships between the levels of supply chain integration. Moreover, this contribution addressed a recently called for question about the interrelationships between the levels of integration (Schoenherr and Swink, 2012; Gimenez *et al.*, 2012) and the importance of internal company integration to the successful implementation of supply chain integration. Furthermore, the importance of this finding is that it suggests

that when the supply chain integration was studied extendedly across suppliers, manufacturers and customers it allowed the interrelationships between levels of integration to be better understood.

This research contributed to knowledge also through providing insights on the subject of supply chain visibility. The empirical research suggested that supply chain visibility can be achieved through the implementation of supply chain integration within the firm and with suppliers and customers. The research confirms the importance of the quality of information shared, technological integration and close relationships to enhance visibility but also suggests that the standardisation and close coordination of materials provide higher levels of visibility.

Finally, when the term supply chain integration is used, researchers should not only consider one or two of its constructs such as information or actors' integration but rather all of the constructs of supply chain integration of actors, information, material and technological integration. Referring to an individual component as supply chain integration would be misleading. Therefore, future studies on supply chain integration need to make clear what components and levels of integration are the focus of the study. For instance, instead of stating that the focus of the study is supply chain integration but actually the study is focused on one or two levels or components, future studies need to refer to such components or levels individually rather than as supply chain integration.

8.2.2 Contribution to Research Methodology

A methodological contribution of this thesis relates to the unit of data collection. This thesis adopted a novel methodological approach for understanding supply chain integration through collecting evidence from garment manufacturers, suppliers and customers across five case study supply chains. Previous literature on supply chain integration failed to cover the different levels of supply chain integration and focused on collecting evidence from only the focal company (Cousins and Menguc, 2006; Prajogo and Olhager, 2012; Zhang and Huo, 2013). This contradicts the notion of supply chain management where the external partners are the novel elements (Van Donk and Van der Vaart, 2005). Hence, this thesis was different from previous research in that it collected

empirical evidence from the supply chain members at the three different levels of external supplier, external customer and internal company integration.

The analysis process suggested that the triangulation of data across the supply chain was essential in developing and validating the empirical findings in this thesis. Therefore, neglecting the views of the supply chain partners would have distorted the results. It could not be possible, for instance, for the construct of visibility to evolve from the empirical model without this approach of studying integration at three levels across the supply chain and conducting a case study research based on evidence collected from suppliers, manufacturers and customers. In order to make advancements in the supply chain management discipline, researchers need to validate the empirical findings of their research through a better design and rigour.

8.2.3 Contribution to Research Philosophy

This thesis also contributed to the philosophical debate in research through suggesting a more integrated way for conducting phenomenological research in supply chain management. The argument was that previous phenomenological studies have applied phenomenology with some elements of positivism as researchers are frequently inquiring into reality across the supply chain from only the perspective of the focal company. It was suggested that supply chain researchers cannot claim to be applying a phenomenological approach while ignoring the existence of other supply chain actors' perspectives. Therefore, phenomenological research in supply chain management needs to be identified through stressing the importance of the involvement of supply chain partners. Thus, this thesis departed from a compromised view of phenomenology to produce a distinctive view of a supply chain as a group of companies.

8.2.4 Contribution to Practice

The discussion of the theoretical contribution to knowledge suggested that internal company integration is necessary for achieving external customer integration but internal company integration efforts will not result in high benefits without achieving external customer integration. Thus, the thesis proposed that manufacturers need to first have the structure of both internal company integration and external customer integration and then achieve external customer integration in order to be able to reap

higher benefits from internal company integration. Practically, this finding is important to manufacturers who are striving for improved competitive advantage with limited internal resources available. Therefore, this finding is of practical implication and was necessary in order to provide suggestions on maximising the benefits of the manufacturers' limited resources through understanding how to manage their integration efforts and increase the internalisation of external resources.

Based on these contributions to knowledge, the thesis provides more specific implications for the firms and managers who participated in this research. Thus, the next section introduces practical recommendations for Jordan's garment manufacturers and their supply chain partners.

8.3 Implications for Jordan's Garment Manufacturers and Decision Makers

This research provides recommendations for improving the competitive advantage of Jordan's garment manufacturers supplying products throughout Europe and the rest of the world. The garment manufacturers were able to develop strategic resources through integrating their internal operations. Furthermore, investment in an internal information sharing system was necessary for garment manufacturers in order to achieve higher internal company integration and supply chain integration. The empirical findings suggested that the manufacturers who did not integrate externally with customers were not able to reap high benefits from internal company integration. Therefore, this thesis recommends that Jordanian manufacturers need to focus their resources to invest in external integration in order to reap higher benefits from their internal company integration efforts. It is also recommended that Jordan's garment manufacturers need to achieve external integration in order to increase the internalisation of external resources. The manufacturers need to first have the structure of both internal company integration and external customer integration and then achieve external customer integration in order to be able to reap higher benefits from internal company integration. Therefore, it is necessary for garment manufacturers to understand the interrelationships between the levels of supply chain integration in order to maximise the benefits of their limited resources.

The garment manufacturers appeared to need a strategy for selecting and building relationships with their suppliers. The lack of common beliefs and communication difficulty because of language difference appeared to impact on the level of integration

between the garment manufacturers and their international suppliers. Therefore, garment manufacturers need to take into account these issues when selecting their suppliers. This could be performed through collaboration between these manufacturers and the public sector and trading bodies such as the J-GATE. However, this issue was suggested as an area of future research as detailed later in this chapter.

Another recommendation that is given to Jordan's garment manufacturers and their suppliers and customers is to make use of the emerging online tools for facilitating communication with their partners. The main advantage of these tools is that they are easily available, easy-to-use and inexpensive. However, these are considered as supporting tools that need to be supported with the use of more integrated technologies such as an EDI connection with the supply chain partners.

Finally, Jordan's garments manufacturers appeared to lack several competencies and value adding activities that would enable them to develop a sustainable competitive advantage. These included a lack of sourcing capabilities from international suppliers and in-house design capacity. Therefore, this thesis suggests that Jordan's garment manufacturers could bring their manufacturing competencies to a higher level through developing both design and sourcing competencies.

Having addressed the research objectives and introduced some recommendations for Jordan's garment manufacturers, the next section acknowledges the limitations of the research.

8.4 Research Limitations

In this section five limitations are presented. The first limitation is related to the sample size of the qualitative case study research where only five case studies were investigated in this research. This research was based on the phenomenological context of these five case studies. Although the evidence from multiple cases is usually more compelling than evidence from a single case, there needs to be caution when generalising the findings of this inductive research to a larger business community. However, the case study selection criteria identified in Chapter 4 and the detailed background information about the participating companies in Chapter 5 together with Appendix F provided a reference for disseminating the results.

The participating companies in this case study research were selected based on clear selection criteria as detailed in Chapter 4. The selected focal companies were garment manufacturers based in Jordan; however, three of these companies were based on foreign investments in Jordan and two of which are Jordanian companies. Although there did not seem to be clear differences between the approaches followed in managing their supply chains, the inability to differentiate between the business style of these companies is seen as another limitation of this research.

The third limitation of this research is using a single theory (i.e. RBV) for interpreting the findings. Although RBV theory was seen as a powerful paradigm for understanding how supply chains can achieve a competitive advantage, using other paradigms would contribute to improve the validity of this research. As supply chain management is still an evolving discipline, it was not easy to explain the complexity of supply chain integration using a single theory.

The fourth limitation is related to the inability of the empirical findings to define a clear relationship between external supplier integration and the other levels of integration. Although this research provided an original finding by filling a gap in the literature about the interrelationships between the internal company integration and external customer integration, it was not possible to explain how external supplier integration interrelated with external customer and internal company integration. The reason appears to be related to the high similarity between the five focal companies in the case studies in that they did not achieve external supplier integration.

Despite the strength of the methodological design of this research in terms of extending the unit of data collection to include not only focal companies but also suppliers and customers, not being able to study the development of supply chain integration phenomenon over a longer time frame can be seen as a research limitation. Thus, the final limitation of this research is related to the inability to conduct a longitudinal study design. Such design would have provided a greater understanding of how relationships developed over time and allowed the observation of the progress made as a result of adopting integration initiatives. The adoption of a longitudinal design would be particularly useful to gain a better understanding of the interrelationships of the levels of integration and which level needs to be achieved first. However, the time constraint in

terms of the need to complete this thesis within a particular time period did not allow for developing a longitudinal design.

This section identified the major limitations of this research which need to be taken into account. The final section will now provide suggestions for future research.

8.5 Future Research

A major avenue for future research is to validate the findings from the multiple case study research through conducting quantitative research that covers a larger sample.

Developing a longitudinal design for inquiring into supply chain integration is also suggested for future research. A temporal design is needed to better understand the interrelationships between the levels of supply chain integration and which level needs to be achieved first. A longitudinal study would also provide a greater understanding of how the supply chain integration components such as material integration were developed and observe the impact of developing material integration initiatives over time. This is particularly important as to observe the changes that might happen to supply chain integration levels in the presence of and prior to achieving a specific level of integration. Thus, this would be an interesting area of research that this thesis calls for in future studies.

The findings from this research suggested that supply chain visibility can be improved through achieving supply chain integration across suppliers, customers and internal production and supporting functions. Therefore, further research is needed to validate the findings about supply chain visibility.

This research benefited from the resource-based view (RBV) theory for underpinning competitive advantage in supply chain integration. However, other theories such as transaction-cost economics (TCE) could be used to understand competitive advantage especially in the presence of the nominated supplier model which appeared to be a dominant business model in Jordan's garment manufacturers supply chains. TCE could be used to understand the savings from adopting the nominated supplier model through economising on the transactions. To increase the benefits of using the TCE theory, it would be useful to consider not only the integration of manufacturers and their customers and suppliers but also the integration between the customers and their nominated

suppliers. This should be useful to understand the basis on which the customers have nominated these suppliers and what benefits are gained by adopting the nominated supplier model.

Future research concerning Jordanian garment manufacturers could differentiate between the Jordanian companies and the foreign companies when investigating the Jordanian garment industry. It would be interesting to investigate whether there are differences in the way the Jordan-based investors and national Jordanian companies manage their supply chains and the impact of any differences.

Future research should also explore the role of cultural differences between Jordanian garment manufacturers and their external suppliers and customers in achieving supply chain integration. It was found from the empirical case studies that there were communication difficulties because of language difference between the manufacturers and their international suppliers. Therefore, this gives an indication that there might be culture-related issues affecting supply chain integration.

Finally, future researchers are encouraged to investigate the impact of developing design and sourcing competencies by Jordan's garment manufacturers. The empirical investigation suggested that the garment manufacturers lacked in-house design and international sourcing competencies. However, there is a need for further research to investigate whether these competencies would result in higher benefits for the focal companies and a direct impact on achieving supply chain integration.

8.6 Chapter Summary

This chapter addressed the research objectives. The contributions to knowledge made in this thesis were summarised and clearly stated in this chapter. The thesis suggested a number of recommendations for Jordan's garment manufacturers and decision makers based on empirical research. This chapter presented the research limitations and introduced some proposals for future research. The research suggested that future research in supply chain integration needs to consider the three levels of supplier, customer and internal integration and that the unit of data collection and data analysis should not be limited to the focal company. The thesis also suggested that further work is needed to investigate the interrelationships between the levels of integration and the relevance of internal visibility for achieving higher supply chain visibility.

9. References

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10. Appendices

There are six appendices in this thesis labelled from A-F. An overview of these appendices is introduced as follows:

- **Appendix A** presents the case study protocol
- **Appendix B** introduces the pilot case study. The appendix is divided into two sections, B.1 and B.2.
 - **B.1** provides a background about the pilot study and conducts a basic analysis
 - **B.2** presents the pilot study protocol
- **Appendix C** presents the data coverage and mapping
- **Appendix D** presents the list of documentary evidence
- **Appendix E** provides an overview of the garment sector in Jordan
- **Appendix F** provides additional information about the focal companies involved in the case study research.