

Collaborative Logistics Triads

in

Supply Chain Management

A thesis submitted in fulfilment of the requirements for the
degree of
DOCTOR OF PHILOSOPHY

in Cardiff University

by

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Abstract

Within the field of supply chain management this work focuses on the logistics element studying from both theoretical and practical perspectives the role of logistics provision in creating enhanced value propositions. In particular, it focuses on relationship management involving logistics service providers and asks whether the “logistics triad”, as it has become known, is a minimum appropriate unit of analysis for examining the role of modern outsourced logistics within the setting and goals of supply chain management.

Recent decades have been characterised by a period of unprecedented change across industries and an intensification of the nature of competitiveness in the marketplace. One strategy deployed by companies has been to closely manage how they conduct their cross-functional business processes, both internally and externally. This inevitably has included developing relations with business partners. In freight distribution, as logistics service provision has become a popular outsourcing activity for many reasons, academic research has focused predominantly on the improved integration of logistics services within their specific supply chain network. Logistics has moved from being a liability to be managed, to a source of potential competitive advantage.

Much of this literature has centred on the two-way or dyadic relationship between the outsourcer of logistics, the shipper, and the logistics service provider. However, in logistics provision, a third party logistics service provider in each supply chain it operates within has an inherent relationship with not one but two other connected parties: the party it is contracted to, the shipper (also known as the consigner) and the consignee. This leads to the conclusion that business relationships in logistics should be assessed and managed on a tripartite rather than a dyadic basis between all three inter-connected parties. This study explores this thinking assessing the feasibility of collaborative logistics provision on a tripartite rather than a dyadic basis.

The research approach is structured in principally three phases. First, the inductive phase combines empirical research in the field of logistics service provision with

critical literature reviews and has two principal aims. Firstly it aids the development of a fuller understanding of the issues and knowledge which contextually surround this evolving subject. Further, it helps refine the focus of the core research activity in the study, supporting the development of a theoretical framework and research questions on the subject of the collaborative logistics triad.

The second phase is deductive in nature and features a longitudinal case study which assesses the strengths and weaknesses of selecting the logistics triad concept as a commercial approach. It is shown that when all three parties involved in the collaborative logistics triad focus on aligned goals with clear, shared performance indicators considerable improvement in logistics performance can be realised.

The implications and potential for scaling up the collaborative logistics triad concept are then assessed. This is achieved by gauging the response of logistics professionals to questions stemming from the principal findings from both the exploratory study and the collaborative logistics triad case study at a major conference for logistics professionals.

The overall findings have implications for supply chain management and logistics theorists as well as practising industry personnel involved in logistics provision. The study concludes that the collaborative logistics triad concept, although in theory a sensible unit of analysis, where improved performance by alignment of all three parties behind shared aims was demonstrated, in practice is a very challenging ideal to set up and sustain. However, there are clear advantages for those that can achieve it and it represents a good source of competitive advantage for those companies keen to compete through enhanced supply chain logistics practice excellence.

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And finally, and most importantly, I would like to thank my family and friends who put up with so much as I pursued this goal. They played a massive role in my completion of this study. Most notably my gratitude goes to my direct family; my wife Karen and our children, Gabi, Rhianna and Nia as well as my son Tom.

Preface

At a recent conference focussing on freight transport in supply chains attended by over 200 delegates¹, the call for improved partnering in the management of transport between users and providers, was loud and clear (Boughton, 2004; Mason, 2004). Speakers and delegates were united in their recognition of the desirability of adopting a more collaborative approach to freight transport management, if improved results for both hauliers and customers of freight transport were to be realised. The research which fed into this conference, derived from a three year EPSRC sponsored Department for Transport (UK) linked programme led by Cardiff University, followed by a further three year EPSRC programme which continued to develop the study at the university's Innovative Manufacturing Research Centre (CU-IMRC).

I was a member of the research teams on both projects which also included senior management connected to logistics provision from two industrial sectors, steel and grocery (as well as construction in the second programme), further supported by senior representatives from the Road Haulage Association (RHA) and the Department for Transport (DfT) in the UK. The main objective of the programmes was to generate generic benefits which could enhance the effectiveness and efficiency of freight transport. In particular the projects sought to document and analyse logistics, transport and management practices involved in current supply chains.

This study is derived from my own research within these projects and beyond and provides an up-to-date picture of where my thinking and theoretical development has progressed. It is hoped that it contains knowledge that is both of practical use to the industrial community² as well as to the benefit of academic theory.

I should therefore like to extend my acknowledgements to all participants who have been involved in the two research projects from university, industrial and government settings for their on-going support of my study and for providing such a rich source of knowledge and contacts in the domestic logistics industry.

¹ Transport in Supply Chains Conference, Belfry Hotel, Sutton Coldfield, UK, 6th October 2004

² A second conference, Transport in Supply Chain Networks, was successfully organised on 27th February 2008 again at the Belfry Hotel to an audience of around 100 principally industry practitioners and featured many of the research findings from this study

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Glossary

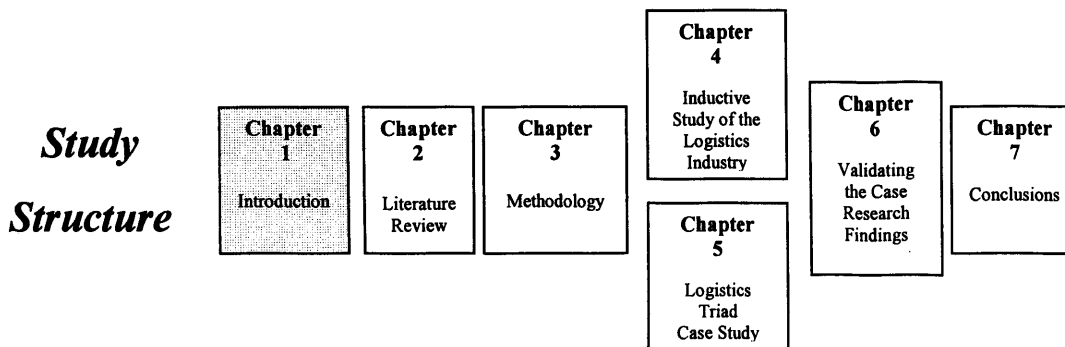
- 3PL** – Third Party Logistics
- 4PL** – Fourth Party Logistics
- CEC** – Chief Executive Chairman
- CLM** – Council of Logistics Management (US)
- CSCMP** – Council of Supply Chain Management Professionals
- CSDP** – Customer Service Delivery Promise
- CU-IMRC** - Innovative Manufacturing Research Centre (CU-IMRC)
- DfT** – Department for Transport (UK)
- DoT** – Delivery on Time
- ECR** – Efficient Consumer Response
- EPSRC** – Engineering and Physical Sciences Research Council
- FTA** – Failure to Arrive
- IGD** – Institute of Grocery Distribution
- ICT** – Information Communications Technology
- KPI** – Key Performance Indicator
- LSI** – Logistics Service Intermediary
- LSP** – Logistics Service Provider
- MP** – Mass Production
- MTO** – Make to Order
- MTS** – Make to Stock
- OTIF** – On Time in Full
- QLF** – Quality Loss Function
- R&DOTT** – Ready and Delivered on Time Tonnes
- RBV** – Resource Based View (theory of the firm)
- RoTT** – Ready on Time Tonnes
- SCM** – Supply Chain Management
- SCO** – Supply Chain Orientation
- SME** – Small and Medium Enterprises
- TCE** – Transaction Cost Economics
- TQM** – Total Quality Management
- UK** – United Kingdom
- US** – United States

Chapter 1

INTRODUCTION

Chapter Aims

- Δ **Summarise the background context of the thesis**
- Δ **Establish the motivation for the thesis's focus**
- Δ **Introduce the scope, the positioning and the purpose of the thesis**
- Δ **Summarise the structure of presentation**



1.1 Introduction to the Thesis

Competitive pressures on all supply chain actors can be considerable in the modern business era. This applies as much to the role of the logistics service provider (LSP) as any other player in the supply chain. How LSPs together with their customers are responding to this, striving to provide enhanced value, to become more competitive to sustain their own business operations, will be at the heart of this research.

Focusing on the field of logistics within the domain of supply chain management (SCM), the study principally looks at the topic of logistics relationship management. The outsourcing of logistics, as an alternative to managing its provision in house in the more conventional vertically integrated firm, has become a powerful option for many customers of logistics in recent decades and has led to the emergence and growth of a relatively new sector of the economy, the third party logistics services or contract logistics industry (Maltz and Ellram, 2000). This has been charted in

numerous yearly surveys, notably in the United States led by Lieb, who noted that the percentage of Fortune 500 manufacturers using 3PL services had grown from **38%** in 1990 to over **80%** (Lieb and Bentz, 2005, Lieb, 2005). Once outsourced, participating firms must determine their inter-relationship strategies.

At the outset of the research a wide-ranging initial question provided the broad focus of study:

“What is the influence of modern Supply Chain Management thinking in the way outsourced logistics provision is conceived and practiced?”

An inductive exploratory study was carried out, focussing on logistics provision within the supply chains of two contrasting sectors: the steel and grocery industries. This preliminary study is presented in Chapter Four. A dominant theme which emerged was the importance of inter-relationship management between the LSP and their customers. The research focus for the main body of the thesis was thus refined and concentrated onto this subject area.

Traditionally, studies of logistics relationship management have predominantly focussed on the nature of the **dyadic** interaction between two parties in the supply chain: the relationship between the Shipper and the LSP (LaLonde and Cooper, 1989, Whipple et al, 1996). In fact, as Mentzer et al (2001) and (Bask 2001) indicate, the LSP forms a link between **two** entities in the supply chain, the original organisation and their customer. This **three** way set up has been termed the **“Logistics Triad”** (Beier, 1989) (Figure 1). The logistics triad is defined as “a cooperative, three way relationship among a buyer of goods, the supplier of those goods, and an LSP moving and/or storing the goods between the buyer and the seller” (Larson and Gammelgaard, 2001). Beier (1989) argued that the logistics triad represents a core building block of logistics service provision in the supply chain, but perhaps surprisingly, little research has been undertaken in this area (Gentry, 1996, Bask, 2001, Larson and Gammelgaard, 2001, Stefansson, 2006, Selviaridis and Spring, 2007 and Marasco, 2008).

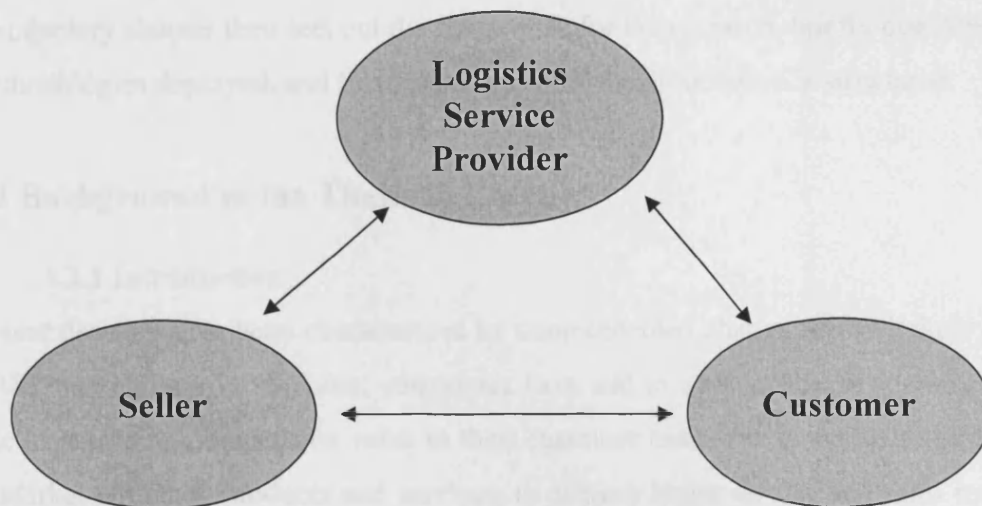


Figure 1: The Basic Logistics Triad (adapted from Bask, 2001)

The main body of this study aims to contribute to the plugging of this shortfall in research on the logistics triad concept by gaining a deeper understanding of how improved information sharing and better alignment of performance measures between the three players of the logistics triad may impact on their inter-relationships and overall supply chain performance. This is summarised in two principal research questions:

△ **How suitable is the logistics triad as a unit of analysis in supporting the role of modern outsourced logistics within the setting and goals of supply chain management?**

△ **How should a logistics triad be managed so that the inherent opportunities are realised and the barriers overcome?**

This introductory chapter sets the scene for the study.

First, the backdrop of the contemporary business environment is presented. The aim is to develop, at an overview level, an understanding of the environmental context logistics service provision is embedded within. This is important to appreciate, as this contextual setting has evolved considerably over recent decades and is a powerful influence on the industrial systems within which LSPs and their customers operate. From this foundation, the scope of the research is delineated. The remainder of the

introductory chapter then sets out the framework for the research, briefly describes the methodologies deployed, and finally presents how the dissertation is structured.

1.2 Background to the Thesis in Practice

1.2.1 Introduction

Recent decades have been characterised by unprecedented change across industry and in the marketplace. In response, companies have had to consistently re-appraise their role in providing competitive value to their customer base. The demands to be faster to market with new products and services, to achieve better service and sales results, together with an on-going lowering of production and distribution costs, have been incessant. In addition, the volatility of the world economy, shorter life-cycles in many product areas, oscillating (and largely escalating) commodity prices and the fast changing dynamics of demand have meant that in many sectors, companies have needed to develop the capability to be increasingly flexible to survive.

New business models centred on the principle of process rather than functional optimisation, have consequently emerged towards the end of the 20th century and into the early part of the 21st century. These are driven primarily by fundamental changes in each of the core elements of industry: the nature of production, distribution (better termed “logistics”) and the customer. Each of these three elements will briefly be explored.

1.2.2 The Modern Industrial Environment

1.2.2.1 Changes in the Nature of Production

Conventionally in production, low costs were generally achieved through economies of scale - the more volume that was pushed through a process, the more diluted the fixed costs became, reducing the costs per item. A re-enforcing feedback loop of standardised products, supplied to homogeneous markets, requiring large volumes of more standardised products at ever cheaper prices could therefore be achieved (Pine, 1993). In turn, product life and development cycles were long. This way of organising production supported the “industrial age”, which dominated much of the 20th century. It was termed the era of Mass Production and saw the development of scientific management typified by the work of Frederick Taylor or Alfred Sloan. In broad terms

the system typically provided customers, who were happy to purchase what was produced, with a steadily improving standard of living. Examples of industries which typified this included the automotive, groceries, clothing, electronics, chemicals, glass, ceramics and steel sectors.

Many firms also protected themselves from economic uncertainties, particularly in the aftermath of the two World Wars, by seeking to own more of their supply chain to seek further economies of scale and improved vertical integration (Chandler, 1969).

In the closing decades of the last century, the nature of production began to change fundamentally. A harsher competitive climate forced many firms to review strategies as the limitations of vertical integration through ownership were exposed. Despite the undoubted success of the Mass Production system, there were also inherent weaknesses within it, which were increasingly exposed as the demands on firms evolved in these latter decades. Authors such as Womack et al. (1990) and Pine (1993) noted that the Mass Production system actually contained much inefficiency, which Womack et al. (1990) described as “waste” activities that added no value to the end consumer such as over production, unnecessary movement of materials, or excessive defect levels. In addition, the inability of the Mass Production system to be flexible and reactive enough to support the needs demanded of production entities such as shorter product development and life cycles and lead times, and the capabilities to produce small batches more frequently, became increasingly evident.

Business models emerged where enhanced efficiencies were pursued through what Adam Smith in his seminal work “The Wealth of Nations”, published in 1776, had explained as the advantages of “specialisation”. This involved taking a more de-integrated approach to ownership, splitting into more manageable and specialised units with a focus on core competencies (Skinner, 1969), which met the order-winning criteria of customer groups (Hill, 1985 and Christopher, 1992). This was combined the emergence of strategies where firms focussed more on process optimised business systems personified by developments largely led and achieved by the Japanese. One process based strategy embodied just-in-time production and total quality management and was termed as Lean Production when it was popularised by western authors (Womack, et al., 1990) after a major benchmarking study of the

automotive sector. Indeed, the authors termed “lean” as the antithesis of Mass Production. Further enhanced by ICT developments such as improved information sharing between functions and firms, process thinking led to many firms challenging the traditional functional way of conducting business typified in the Mass Production era.

The new paradigm was more holistic than the traditional, more myopic focus on functions such as sales, distribution, purchasing or production. The ideal was to drive inter-functional coordination amongst departments, across business units, and ultimately up and down the chain of supply so that the whole production system acted as if it were one organisation with the goal of optimising value for the end customer (Figure 2). This thinking led to the emergence of the concept of Supply Chain Management (SCM), which will be examined further in the literature review.

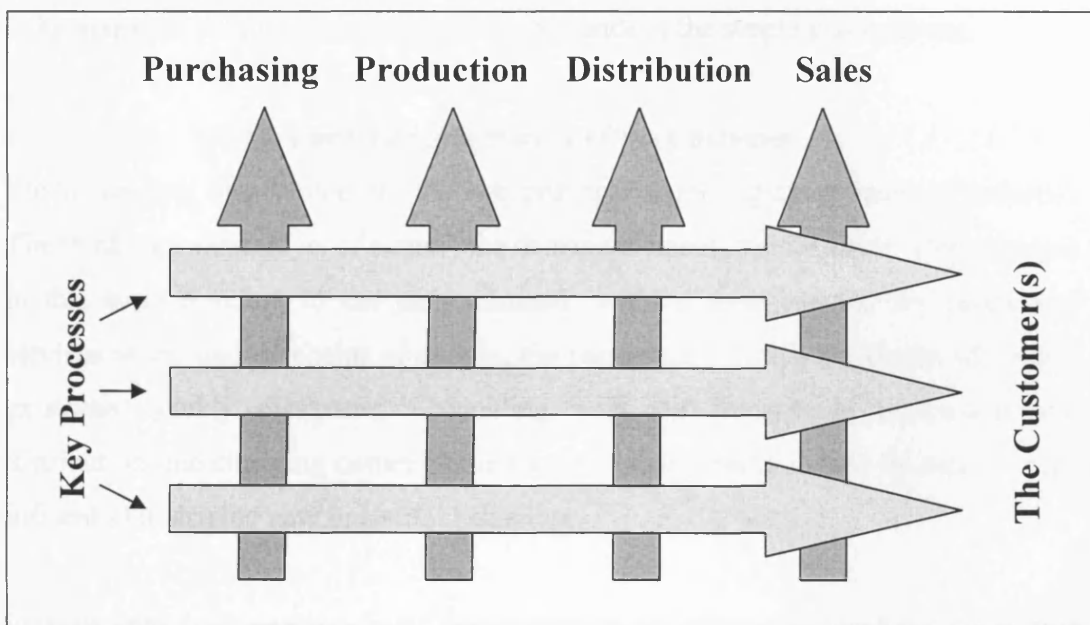


Figure 2: The Importance of taking a Process rather than Functional Management Approach

1.2.2.2 Changes in Logistics Provision

Conventionally, the distribution of raw materials and finished products was in broad terms determined by the producers who logistically sought to get their products to market as cheaply as possible. This was invariably managed in-house by so called “own-account” transportation departments. In the more modern industrial

environment described above however, notably where firms pursued a more de-integrated approach to ownership, non-core activities such as logistics service provision became one of the most commonly out-sourced elements. This point was supported by Harland (1996) who noted that there was an underlying tendency to rationalise the business focus on production operations while outsourcing service operations. Certainly, logistics service provision became one of the most attractive business areas to outsource and this factor was a major contributory driver which led to the development of a growing industry of specialised logistics firms.

In addition, the shift of emphasis to a more process orientated approach elevated the importance of supply chain activities such as logistics. The reliable operation of the supply chain system depended on the goods arriving consistently on time to the right place (time and place utility). This meant that logistics service provision was characterised as an integral process within the domain of SCM (CLM, 1998), and had to be managed within the context and the demands of the supply chain setting.

1.2.2.3 The Changing Nature of the Customer

Production and distribution are the two principal supplying components of industry. The third core element is, of course, the demand element, the customer. The customer in this context refers to the end-consumer; without their demand for goods and services at the end of chains of supply, the reason for a firm's (or chains of firms') existence quickly dissipates! Coinciding with the changes in production and distribution, the changing nature of the customer and what is valued by them is very influential in driving new industrial behaviour.

In many sectors, companies found that customers no longer could be lumped together in a homogeneous market, but were more individualistic in their wants and needs. There had always been niche companies that offered bespoke services such as tailor-made suits, but at a premium price. Now more bespoke solutions were required with the efficiencies of the mass market retained. This required the provision of more specialised product offerings to accommodate the demands of more narrowly delineated market segments, as well as in some cases genuine bespoke options. In addition, value was less defined by price. As markets matured the power began to

shift to the buyers who, “demanded higher quality goods that more closely matched their desires” (Pine, 1993).

In effect this turned the chain of supply on its head. In the old era, the consumer was positioned at the end of the supply chain: they bought in effect whatever was produced. In this more modern industrial environment the buyer was at the beginning (as well as at the end) of the chain: producers existed to supply what the consumer wanted. They became market orientated.

Moreover, the customer never stood still, constantly demanding further improvements in terms of lower prices and/or better service and/or more choice (Shellard, 2007). So developing supply chain systems which were not only market orientated, but also able to continuously improve and be capable of responding to the dynamic whims of the customer, became crucial to the notion of sustainable competitiveness.

1.2.2.4 Characteristics of the Modern Business Era

Consequently, industry after industry became characterised not just by innovations in their products but also by high degrees of process innovations. Broadly, this is the backdrop from which the concept of SCM emerged and in which LSPs and their customers have to operate within, where, “the effectiveness of the whole (supply chain) is more important than the efficiency of any one part” (Hoekstra and Romme, 1992).

This holistic notion is a critical issue that underpins this study. Although ways to extract more value from the logistics operation are examined in this thesis, the optimisation of a logistics activity such as freight transportation at the expense of the whole supply chain is not the aim. The goal should be, in keeping with systems thinking, to optimise the value of the supply process as a whole, rather than through the optimising of individual components of the system such as, for example, the transport function (Ellram and Cooper, 1990, Houlihan, 1988). Perhaps logistics should actually be termed holistics!

This background discussion has begun to describe why it is important that SCM and logistics management strategies need to be understood within the contextual setting of

the wider modern industrial environment (Figure 3). The section has explained why the adoption of a “supply chain orientation” (Mentzer et al, 2001) has become more prevalent in recent years in many sectors of the modern economy and why for many it is argued that logistics provision, which is an integral element of the physical supply chain process, needs to be managed from a supply chain perspective if a competitive strategy based on process competence is to be pursued.

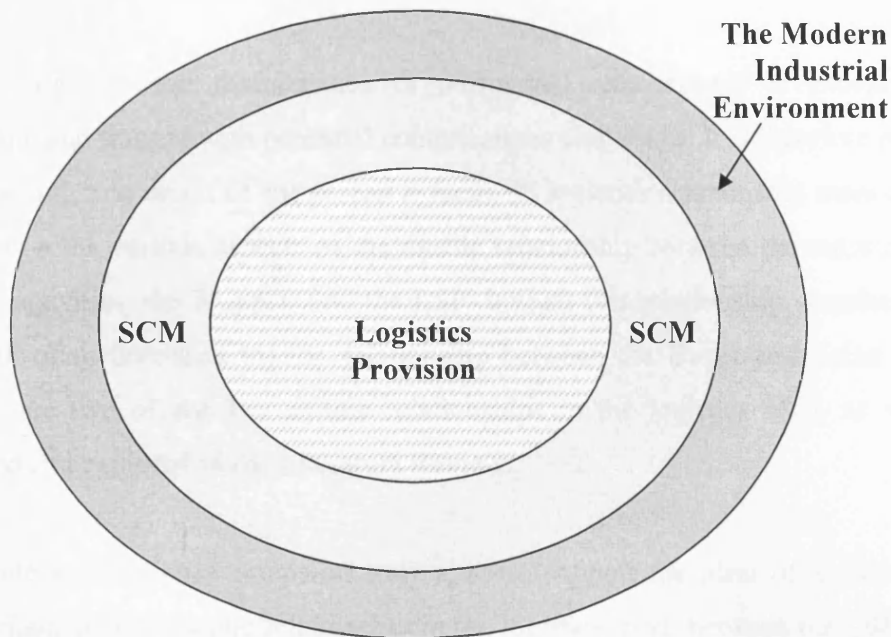


Figure 3: Logistics Provision is an integral process within SCM, which in turn is enmeshed in the Modern Industrial Environment

1.3 Relationship Management in Logistics

1.3.1 Introduction

“The delivery system has become a more integral part of the manufacturer’s product offering – and as such logistics is increasingly viewed as a driver of differentiation thus requiring a partnering orientation”.

Whipple and Gentry (2000)

As indicated in the description and exploration of the modern industrial environment, firms have become more specialised, focusing on their core competencies and

therefore have outsourced many activities that they perceive are beyond their agreed scope. One such activity which has been particularly prone to outsourcing is logistics provision. However, if an activity is outsourced, a fundamentally important second decision has to be taken. On what grounds should the relationship with the outsourced LSP be based?

1.3.2 The Logistics Dyad

The development and maintenance of outsourced relationships is exceptionally demanding and fraught with potential complications and issues. It is therefore perhaps not surprising that much of the research focus on logistics relationship management has been on the various aspects of the dyadic relationship between the outsourcer of logistics activities, the Shipper, and the LSP. Indeed, this relationship, together with, (although often unrelated to) the relationship between the Buyer and Seller of the product, are two of the key dyadic relationships in the logistics triad, as will be explained and explored in the Literature Review.

Nevertheless, if logistics provision truly aims to support the ideal of an integrated supply chain, a third dyadic relationship in the logistics triad, between the LSP and a third party (invariably the Buyer of the goods if the logistics contract is managed by the Seller, but occasionally the Seller where the logistics contract is managed by the Buyer) may need to be assessed and managed if a weak link in the chain is to be prevented from emerging.

1.3.3 The Logistics Triad

Bask (2001) noted that the principal cause for the research focus in logistics literature on the dyadic relationship between the Shipper and the LSP was due to the fact that logistics contracts were usually managed between the Seller and the LSP or the Buyer and the LSP, but not both. In fact, as Mentzer et al (2001) indicate, the LSP forms a link between two entities in the supply chain, the original organisation and their customer. Thus the LSP does not just have a contractually based link with one party (the Shipper or Consigner), but also a service link to the other party (the Consignee).

This three way relationship is termed the “*logistics triad*” and was first coined by Beier (1989).

It can be argued that the logistics triad represents a core building block of logistics provision in the supply chain. Indeed, it has been suggested that business relationships in logistics should be assessed and managed on *a tripartite* rather than a dyadic basis between all three inter-connected parties (Larson 1992, Bask, 2001, Larson and Gammelgaard, 2001 and Stefansson, 2006). However, as will be set out in the literature review, there has been a paucity of research concerned with the logistics triad concept. For example, Gentry (1996) observed that, “virtually no research addresses the three way linkage of the transportation provider between supplier and purchasing firms”, and more recently Stefansson (2006) concluded that, “we, along with other authors, have identified only a few related subsequent studies” (on the topic of the logistics triad).

This intuitively feels strange. The links the LSP has, not just with the party it is contracted to, the Shipper, but also the third party in the triad, usually the customer, would seem to be important if the goals of integrated supply chains are to be fully realised. If pursuing a strategy rooted in better managing the supply chain is considered as a legitimate business pursuit towards achieving a sustainable competitive advantage in today’s more process orientated business climate, it would seem to be critically important to ensure that every link in the material flow of goods down the chain is well managed with appropriate under-pinning relations between parties, not just those where a contract underpins the relationship.

The research in this study aims to contribute to the plugging of this shortfall in the research in and understanding of the logistics triad concept.

1.4 Scope of the Thesis

It is important to clearly define the focus of any research thesis. This study is positioned within the area of supply chain management (SCM). SCM, as will be explored in the Literature Review and Methodology chapters can be seen as, “an

emergent field of practice and an emerging academic domain” (Storey et al, 2006). SCM is a large topic so a discussion to de-lineate the study’s focus and to communicate what is beyond its scope is presented here to help to clearly delineate the scope of this research study.

To aid this task Burgess et al’s (2006) classification framework which was developed to help structure the SCM field, has been used as a tool to be more precise about the study’s perspective. The framework consists of groupings developed by Burgess et al (2006) to categorise research activity in this area, and two have been used here to indicate where the research is positioned (more details of this approach can be found in the Methodology Chapter, Chapter Three).

1.4.1 Defining the Territory of the Research

The initial grouping Burgess et al (2006) deploy aims to, “define the territory that researchers claim falls within SCM”. Within this they assess the *conceptual framing of SCM, its constructs, and its discipline bases*.

In terms of *framing* there is no commonly used definition for SCM. Croom et al (2000) highlight that although SCM is becoming increasingly popular and is receiving much attention since it was first conceived in the early 1980’s it, “conceptuallyis not well understood”. Burgess et al (2006) therefore devise a classification scheme to aid the conceptual, “*Framing of Supply Chain Management*” with four categories: *Activity, Process, System or Other*. These are explained in Table 1.

From this conceptual schema this study’s focus can be selected as the “**System**” category. It is envisaged in this study that SCM operates at a greater level than “*Process*” level, whilst, although there are deeper issues such as inter-organisational relations which are explored and assessed in the research, most aspects of the “*Other*” level are beyond the scope of this thesis.

Conceptual Schema	Definition <i>The Literature Describes SCM as:</i>
Activity	<i>an individual function in a process</i>
Process	<i>a chain of related activities</i>
System	<i>a series of related processes</i>
Other	<i>a deeper level of analysis dealing with inter-alia, sociological, psychological, and philosophical concepts</i>

Table 1: Definitions of a Conceptual Schema to Categorise SCM Academic Publication Outputs (Burgess et al, 2006)

In terms of constructs of SCM, Burgess et al (2006) identify seven, but find again there is no common theme which is detectable. The seven constructs are:

- Δ **Leadership** – “capturing the strategic nature of SCM and the need for a senior management team to be proactively involved”;
- Δ **Intra and inter-organisational relationship** – “the nature and type of social and economic associations between stakeholders, both within and between organisations”;
- Δ **Logistics** – describing the issues associated with movement of materials within and between entities in the supply chain”;
- Δ **Process improvement orientation** – “processual arrangements that facilitate interactions within and between organisations, with a view to continually improving them”;
- Δ **Information system** – “covering aspects of communication both within and between organisations”, and
- Δ **Business results and outcomes** – “capturing performance related outcomes that organisations accrue from adopting strong SCM orientation”

Burgess et al (2006) note the first three constructs are “*soft*” and more people related, while the last four are the “*hard*” constructs. These constructs allow this study to be positioned, which although in many ways encompassing all of them is orientated to

focus on the hard construct of **logistics** and the soft construct of **inter-organisational relationships**, particularly involving LSPs.

Within logistics the main concentration is on logistics service provision which Mangan et al, (2008) note, “is a generic label..... to describe companies that operate in this (logistics) sector”. Mangan et al (2008) also list a “myriad” of different types of companies which operate in this sector as follows:

- △ Hauliers or trucking companies – who carry freight on trucks and other transport modes;
- △ Freight Forwarders – who arrange transport for freight (especially internationally over borders);
- △ Non-vessel-owning common carrier (NVOCC) companies – who consolidate smaller shipments from various consignees (known as “groupage”) into full container loads;
- △ Couriers – who provide immediate delivery services in particular in urban environments (for example between banks);
- △ Integrators – who oversee and operate a seamless integrated service from product origin to the end consumer, and
- △ Agencies – a joint logistics solution where consolidated buying power increases capacity and reduces rates from carriers

Mangan et al (2008) highlight that in reality there is considerable overlap between all these categories and that many firms operating in this area are more generally known as third party logistics providers, or 3PLs. This study concentrates on the **general 3PL category** incorporating many of the different company types listed above, with a special focus on **road freight transport**, although much of the work has application to other modes of movement.

Burgess et al (2006) then provides a list of potential disciplines which they argue that SCM straddles. These include marketing/services, purchasing, strategy, psychology/sociology, finance/economic, information/ communication, operations management (goods transformation excluding logistics and purchasing functions). Although there is debate surrounding whether logistics is in fact a discipline, using

Burgess et al's classification **Logistics** has been selected as the discipline base for the study, as opposed to other possible discipline bases.

1.4.2 Defining the Theoretical Positioning of the Research

The second grouping Burgess et al (2006) consider, is the theoretical concern of SCM publications. Six theories are selected which include: transaction cost, other economic theories including agency, strategic theories such as the resource based view of the firm and competitive advantage, and psychological theories which include organisational learning and inter-organisational networks. The study is interfaced with many of these theories, as will be set out at the end of Chapter Two, which aid explanation and understanding as well as adding further to theories not included in this list. The main contribution areas are in the theories of **competitive advantage** and **inter-organisational networks**.

A summary of the scope of the research defining the territory of the study and its theoretical positioning can therefore be given as follows:

*The study, in the domain of **Supply Chain Management**, will concentrate on the discipline base of **logistics**. It will conceptually take a **Systems** approach. It will focus on the hard construct of **logistics provision** (with a concentration upon **third party logistics provider** in particular involving **road freight movement**) in conjunction with the soft construct of **inter-organisational relationships**, through the theoretical perspectives of **competitive advantage** and **inter-organisational networks**.*

The study, which is carried out over three phases based on methodological approach, is further de-lined in terms of geography, industry and business model.

In terms of geography, the research will concentrate principally on **domestic** freight movement, which may include some international traffic over shorter distances but largely excludes inter-continental freight movement via multi-modal transportation.

In terms of business model it should be noted that the principles of SCM can be applied to various industrial processes. These include forward facing production and

distribution, after market management, new product development or returns management. This study will focus on the **forward facing production and distribution** field and exclude explicit coverage of the other areas, although the findings may have application in these other types of supply chains where logistics triads exist.

In industrial sector terms, although it is anticipated that the findings will have relevance to many sectors, **Phase One** of the research is a preliminary, inductive exploratory study focusing particularly on two sectors:

- the *steel* industry, which is heavily dependent on freight movement, but which is characterised by a more fragmented supply chain approach. This is contrasted with
- the *grocery* industry, where SCM practice and better optimising of road freight movement has been further developed

Phase Two features a case study using a more deductive research approach focusing upon a selected supply chain in one of these sectors – the steel industry.

Finally, **Phase Three** seeks to better understand the relevance and implications of the research for the wider population of customers and LSPs beyond the two sectors of focus in Phase One and the case study setting in Phase Two through a conference based interactive questionnaire and therefore highlights the relevance of the research to a wider range of industrial sectors.

Now the scope of the study has been set out, the structure taken in presenting this thesis will be summarised.

1.5 Structure of the Thesis

This section covers how the thesis is structured as well as providing a brief summary of the methodological approaches taken. The study is structured as indicated below and can be visually followed using the schematic in Figure 4.

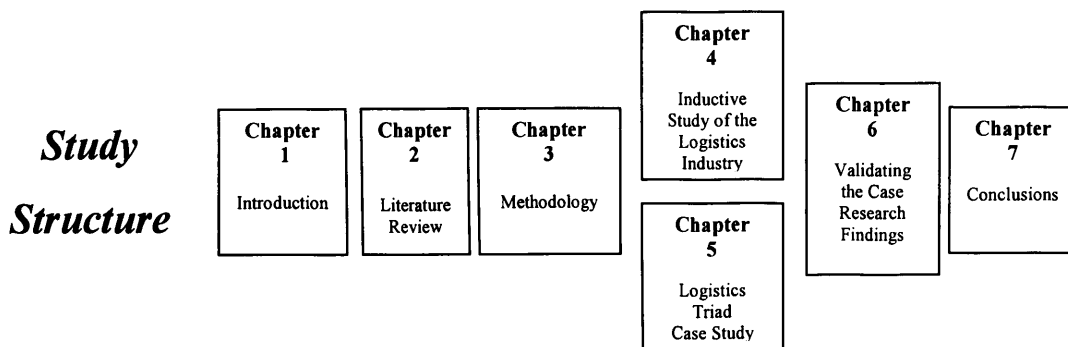


Figure 4: A Schematic showing the Chapter Structure of the Dissertation

In this opening chapter (**Chapter One**), the background to the work is set out. This provides an understanding of the contextual industrial environment and modern SCM setting, which it is argued logistics service provision is embedded within. The principal focus of the research, which is centred upon inter-relationship management in logistics with an emphasis on the logistics triad concept, is explained. This chapter also clarifies the scope of the study, delineating the boundaries of the research. Finally, the dissertation structure is described, which also includes summaries of each of the chapters' contents and includes a brief appraisal of the methodological approaches deployed.

The Literature Review (**Chapter Two**) provides the foundations for the study, critically appraising the pertinent literature. First the wider subject domains of the supply chain and SCM are set out, within which, it is argued, the logistics triad is enmeshed. The core of the chapter centres on the logistics triad concept focussing on each of the constituent relationships in turn. The principal shortfalls in the literature on the logistics triad concept are identified. Next, the theory literature, which underpins this subject area, is critically explored developing constructs upon which the results of the research can later be assessed and analysed. Finally, the main research questions, which will motivate and focus the main body of the research, are set out.

Chapter Three sets out the methodological approach to the study. Initially, by way of introduction, the chapter tackles some of the generic difficulties in producing effective research in applied fields such as the business and management schools of thought.

An argument is developed that many of these issues are also a feature of the sub-discipline fields of SCM, logistics and inter-relationship management.

The chapter then explores the background to the methodological choices made in carrying out this study. It defends the research design methods selected in each of the three phases of research. A mixed methodological approach based on the social sciences is taken in the thesis through the use of qualitative and quantitative methods and the strengths and weaknesses of each method are evaluated. In conclusion, it is argued that the methods adopted are logical and appropriate. They support the production of a range of findings which contribute to the current state of knowledge to the topic area as well as having implications for both theoretical literature and organisations and managers in practice.

The methodology adopted in this study is discussed fully in Chapter Three. However, it is useful to set out at the outset in brief the broad methodologies which have been adopted. The study is divided principally into three phases.

Phase One predominantly tackles, through evidence gathered from practitioners in two sectors, the steel and groceries, a broad initial question:

“What is the influence of modern Supply Chain Management thinking in the way outsourced logistics provision is conceived and practiced?”

It is a preliminary inductive study combining the Literature Review with an exploratory, empirical piece of research focussing upon the grocery and steel sectors. Responses from an audience of logistics professionals to questions developed from the inductive study are presented to support external validation findings and conclusions.

As an exploratory study it supports the development of a more detailed understanding of logistics provision within the field of SCM. It also facilitates, in combination with the Literature Review, the channelling down of the research focus to centre upon the subject of inter-relationship management in logistics. From this approach, specific research questions concerning the management of the interfaces the LSP has with its

customers in the logistics triad, are arrived at. These are then tackled in **Phase Two** of the research.

Phase Two explores the nature of relationship management in logistics in the logistics triad. A longitudinal case study in the steel sector is chosen as the appropriate methodological design and setting. Tangible evidence to support the view that the logistics triad is a viable concept is produced and insight into the way it can be best managed is given.

Finally, in **Phase Three** the study focuses on the external validity of the research findings. Although a case study can provide valuable insights and rich contextual detail its principal flaw is the inability to realise quantitative generalisation, as it is only derived in this study from a sample of one. To partially compensate for this, the results of an interactive questionnaire are presented. This is derived from feedback provided by logistics professionals at a dissemination conference in February 2008 where the principal findings of the case study were exhibited.

This brief discussion of methodological approaches taken is summarised in Figure 5 and leads onto how the rest of the thesis is structured.

Chapter Four presents **Phase One**, the exploratory inductive study of the logistics industry, focussing on the two sectors: the steel and grocery industries. It features the findings from a wide range of interviews and discussions with leading personnel in the logistics industry in both sectors gathered over a number of years. This leads to the formation of the specific research questions.

Chapter Five presents **Phase Two** of the research. Here, the logistics triad in the steel industry is selected as a longitudinal case study to explore the notion of the logistics triad in practice and to examine the research questions set out at the end of Chapter Four.

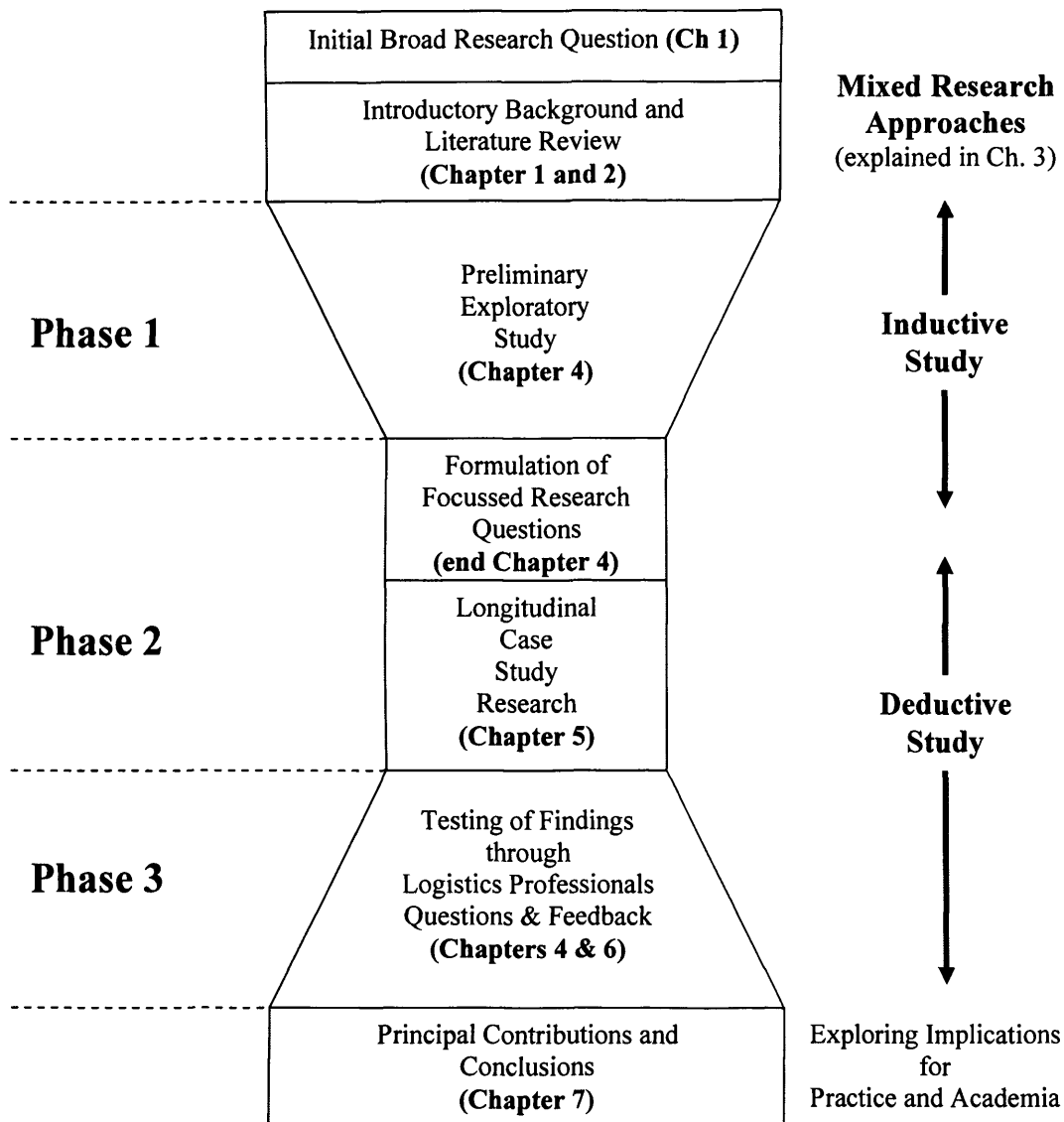


Figure 5: A Schema Summarising the Research Approach Taken in this Study

Chapter Six assesses the main learning points from the case study research and explores the more generic implications for logistic relationship management in general. It includes **Phase Three** of the study where feedback from the professional audience in the logistics industry after the main findings of the research was presented is summarised and discussed. The analysis then looks at the implications for both practitioners and researchers.

In **Chapter Seven** conclusions are reached, the limitations of the research are underlined and suggested areas for future research study are confirmed.

1.6 Conclusions

This chapter has served to introduce the dissertation and the motivation behind the initial research objective and specific research questions. A broad background summary of the modern business landscape LSPs and their supply chain customers typically have to operate within has been discussed. This incorporated an initial exploration of many of the challenges they face which will be further expanded upon in the Literature Review in the next chapter.

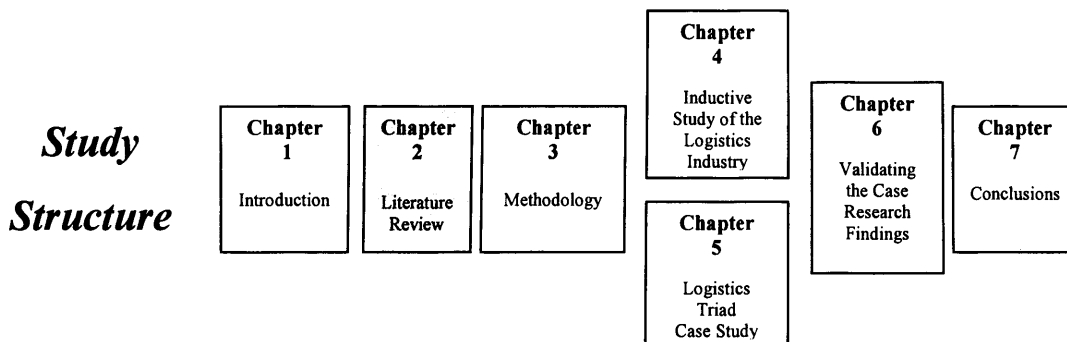
Finally, a summary of the scope, structure and methodology of the research study has been introduced.

Chapter 2

LITERATURE REVIEW

Chapter Aims

- Δ **Introduce the concept of the Logistics Triad**
- Δ **Understand the contextual setting for the Logistics Triad - the supply chain and the SCM concept**
- Δ **Explore the literature pertinent to each of the four relationships inherent within the Logistics Triad**
- Δ **Review the relevant theory underpinning the Logistics Triad**
- Δ **Establish the research gaps and set out the principal research questions**



2.1 Introduction

This chapter establishes the academic foundations for the study from a theoretical perspective. It builds on Chapter One and interfaces with Chapter Four. Chapter One set the scene for the study while Chapter Four, through an inductive research study, channels the research: the broad initial objective of developing a better understanding of the role of logistics provision within the field of SCM becomes more focussed to an examination of the issue of inter-organisational relationships relating to logistics service provision, and ultimately settles upon the principal topic subject area of the research - the logistics triad concept. The products of the combination of these three

chapters are the creation of the refined research questions which are tackled in the main body of the thesis.

The logistics triad is a more complex unit of analysis than perhaps it would first appear. Although only one extra actor is added compared to the basic dyadic Shipper – LSP, or Buyer – Seller relationships, in reality the number of relationships to be considered in the unit of analysis increases by a factor of four, incorporating three dyadic relationships and one tripartite relationship:

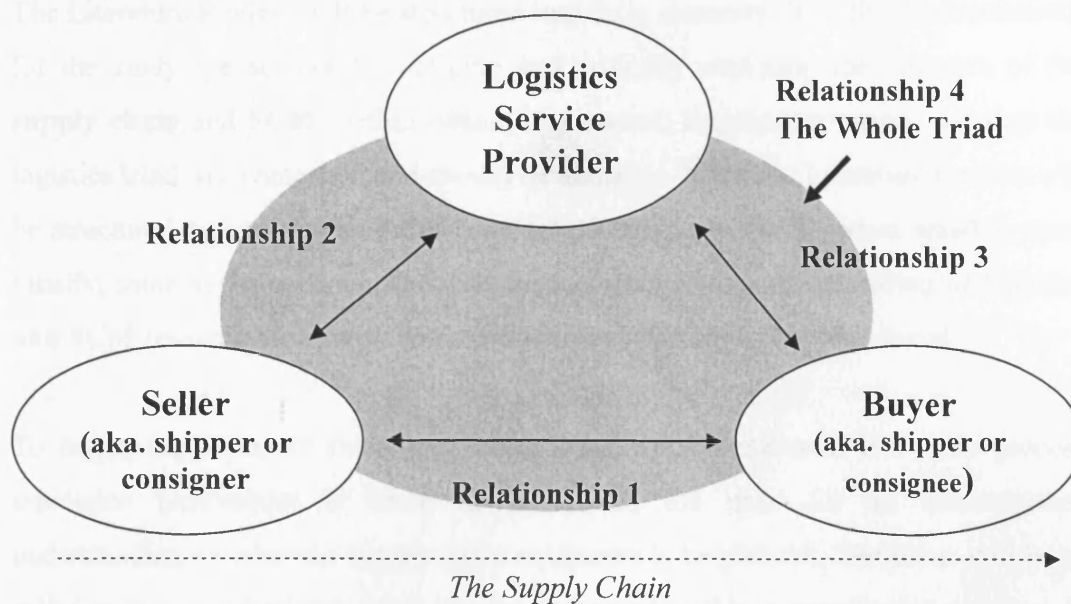


Figure 6: The Logistics Triad - made up of four relationships

The four relationships are indicated in Figure 6 and are as follows:

- **Relationship 1:** The dyadic relationship between the provider of the goods (the Seller) and the customer of the goods (the Buyer)
- **Relationship 2:** The dyadic relationship between the Seller and the LSP
- **Relationship 3:** The dyadic relationship between the LSP and the Buyer
- **Relationship 4:** The tripartite relationship shared between all three parties in the triad

Each of these relationships will be examined in turn at the core of this literature review.

However the logistics triad is organised, the LSPs form a link between two entities in the supply chain; the original organisation (the Seller) and their customer (the Buyer). Thus, if logistics service provision is outsourced, the LSP does not just have a contractually based link with one party (the shipper or consignor), but also a service link to the other party (the consignee). Indeed, Bask (2001) states that this is the very reason that contract logistics is invariably called, “third party logistics”. This three way relationship is termed the “*logistics triad*” (Beier, 1989).

The Literature Review will be structured into three elements. Initially the foundations for the study are set out by defining and critically exploring the concepts of the **supply chain** and **SCM**, within which, it is argued, logistics provision, and thus the logistics triad, are enmeshed and should be managed. Next, the Literature Review will be structured around **each of the four relationships in the logistics triad** in turn. Finally, some of the pertinent **theories underpinning the understanding of logistics and SCM** research are examined before **research questions** are introduced.

To begin, the notion of the supply chain itself will be explored. If a more process orientated philosophy is taken up by firms, the need for an unambiguous understanding of what the supply chain represents is heightened. The focus will be to examine how the logistics triad can be conceived within a supply chain setting. It identifies an interesting facet that in many conceptualisations of the supply chain academics have not consistently incorporated outsourced logistics provision or the logistics triad into their models or frameworks of the supply chain. This highlights the first gap in the literature which can begin to be addressed by this study.

2.2 The Supply Chain and Supply Chain Management

2.2.1 The Supply Chain

“The concept of the supply chain underscores the importance of operations as a counterpoint to strategy”

(Skjøtt-Larsen et al, 2007)

Throughout the research it is argued that freight transport and logistics practice in general, and therefore the logistics triad concept, should be conceived of as integral processes and activities within the supply chain. During the introduction in Chapter One it was noted that as competitive pressures have increased, many companies within supply chains have focussed on their own core competencies and have also become more inter-dependent, inducing them to explore the most effective forms of collaboration. This thinking is as applicable to logistics service provision as to any other echelon in the chain. But what is the supply chain?

Mentzer et al, (2001) note that a definition of the “supply chain” can be categorised in terms of degree of supply chain complexity. There are a range of alternatives. At its simplest the supply chain can be defined as just, “a set of firms that pass material forward” (LaLonde and Masters, 1994). A slightly fuller definition is given by (Lambert et al, 1998) who suggest the supply chain is, “an alignment of firms that brings products or services to market”. Christopher (1992) defines the supply chain as, “a network of organisations that are involved through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services delivered to the ultimate customer”.

Harland (1996) confirms this idea of increasing supply chain complexity in setting out her, “levels of research in supply chain management” (Figure 7). The first level focuses on the firm where she argues that SCM can be practiced by aligning the functions within its own boundaries. Beyond the boundaries of the firm a relationship can be developed with one other firm, a Dyadic partnership, or beyond this with an Extended Chain of firms. Ultimately, the level of SCM can be based at the Network level where the focal firm handles chains of supply that originate through different suppliers’ suppliers and similarly flow through different customers’ customers. It is important to note that this is commensurate with Christopher’s (1992) definition of a supply chain detailed above.

Houlihan and Oliver (1986), in describing their essential attributes of a supply chain include the point that, “membership includes all parties, including logistics operations”, a fact that appears to be missing from Harland’s (1996) conceptualisation discussed above. With this point in mind it is useful to compare the four levels of

supply chain (the Firm, the Dyad, the Extended Chain and the Network) developed by Harland (1996), with the three levels of complexity which Mentzer et al (2001) use to categorise supply chains (Figure 8): the Direct Supply Chain, the Extended Supply Chain and the Ultimate Supply Chain.

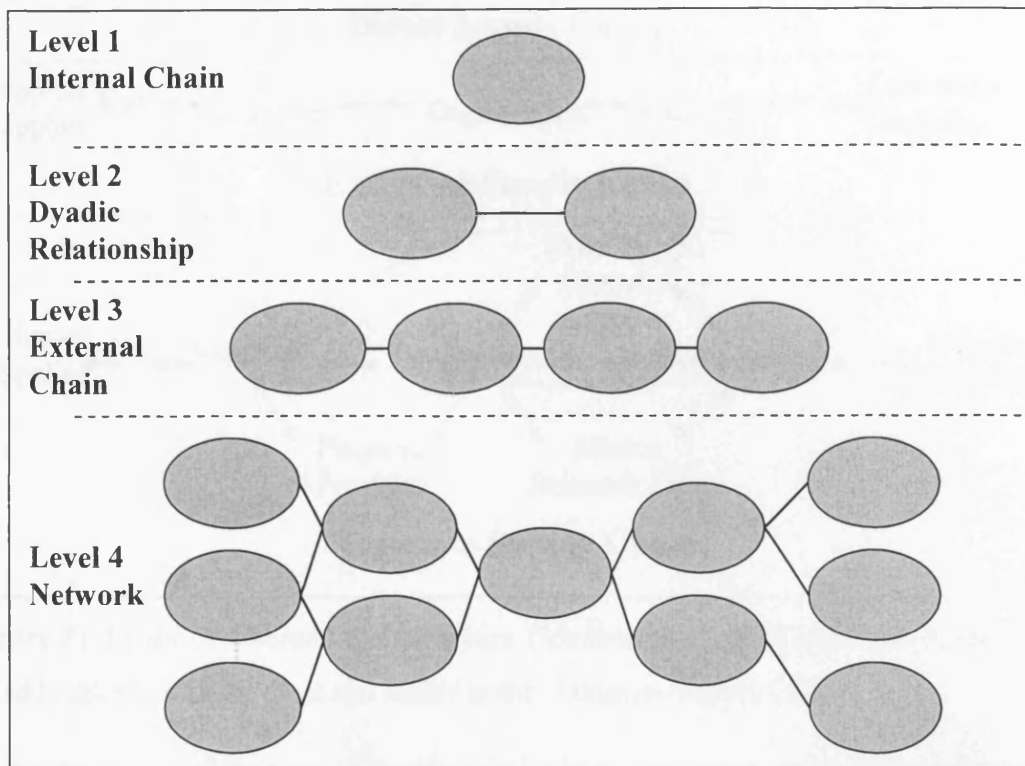


Figure 7: Levels of Research in SCM (Harland, 1996)

Mentzer et al (2001) propose that the minimum number of entities in a supply chain is three so they do not include a supply chain categorisation at the Firm or even at the Dyadic level. From the Direct Supply Chain (similar to the External Chain of Harland’s categorisation) they then envisage an Extended Supply Chain which is a single value stream version of Harland’s Network categorisation. Finally, and important in relation to this study, Mentzer et al, (2001) chart the Ultimate Supply Chain which incorporates third parties within the core value stream of the Extended Supply Chain. This is missing in Harland’s conceptualisation (Harland, 1996). These third party entities can be LSPs or providers of other services such as financial providers or market research firms. It also extends the chain to the “ultimate” customer. Mentzer et al (2001) confirm that, “the logistics service provider forms a link between two entities in the supply chain, the original organisation and their

customer". This three way set up can be identified as the **logistics triad** first coined by Beier (1989).

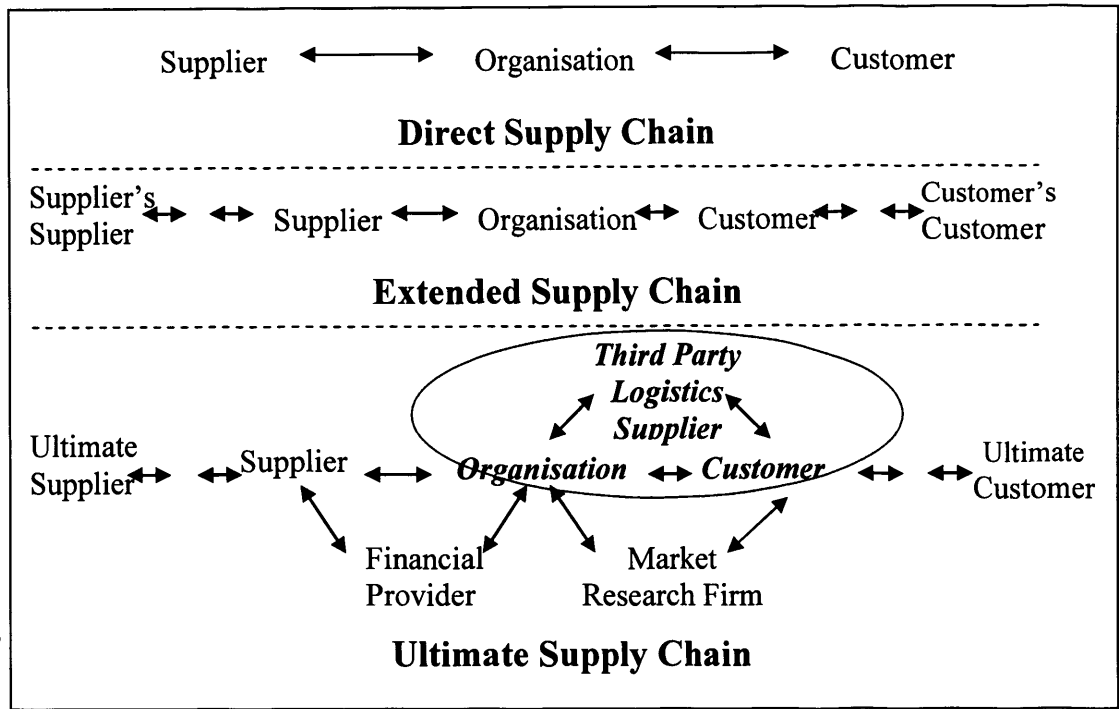


Figure 8: Types of Channel Relationships (Mentzer et al, 2001) with the Logistics Triad highlighted in the oval and *italics* in the "Ultimate Supply Chain"

Increasing levels of complexity each incorporating third party logistics service provision and the logistics triad into the basic supply chain model can therefore be set out at each of the levels outlined by Harland (1996).

- Δ *Firm Level* – there are many examples where logistics activities are outsourced between two functions within the same organisation – for example between manufacturing and warehousing, or between distribution centres and retail stores;
- Δ *Dyadic level* – the Shipper could be the sender or the receiver of the product. In connecting the two supply chain entities a third inter-relationship will exist thus forming a logistics triad;
- Δ *External Chain* – A series of these logistics triads can now be envisaged in the extended supply chain;
- Δ *The Network* - this same notion can be extended to the network supply chain model and illustrates how complicated the supply networks can become.

In conclusion, it would appear that to represent the supply chain as a single linear chain is far too simplistic. An improved perspective, if material movement is seen to be a critical process in the supply chain and assuming that a third party logistics provider is deployed, is to envisage the supply chain as a series of triads across a supply network supported by a number of inter-related and supporting activities.

2.2.2 Supply Chain Management (SCM)

One of the ways it is advocated that the supply or value chain can be better managed, is through the “integration of the primary supply (or value) chain activities into a seamless process” (Lummus et al, 2001). In basic terms this ideal has become synonymous with the notion of SCM, which has attracted increasing levels of interest from practitioners and academics in recent decades. As highlighted above, a constituent of any supply chain where logistics is outsourced is the logistics triad. Therefore, if an entirely “seamless process” is to be realised, it suggests that the effective management of the whole logistics triad, not simply some of the inter-relationships inherent within it, is important. The goals of SCM must cut through the logistics triad (Figure 9) and pervade all aspects of decision making within it if the ideal of a totally seamless process is to be achieved. At the very least all the relationships in the logistics triad must exist within the contextual setting of the contingent SCM strategy.

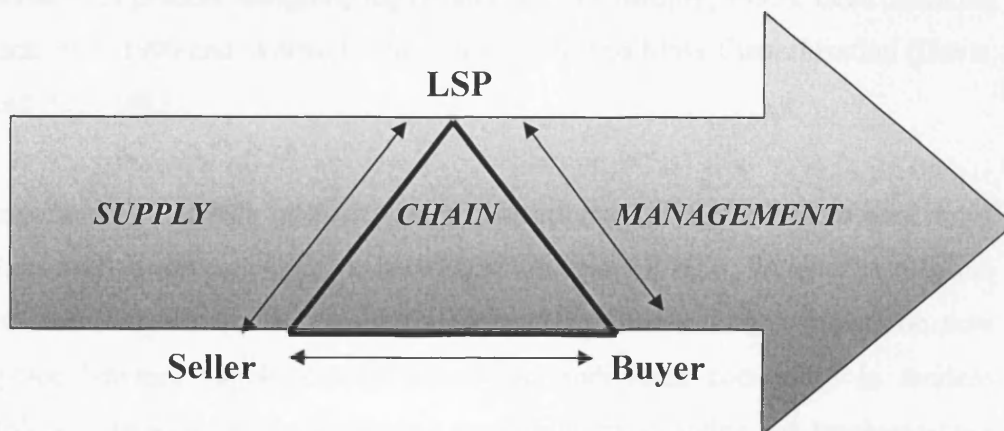


Figure 9: The Logistics Triad is a Core Constituent of SCM

The concept of SCM was briefly touched on in the introductory chapter. This section seeks to expand this concept further so that the essence and purpose of SCM are more clearly understood. It is a subject that has raised considerable debate in recent years.

2.2.2.1 The Origins of the SCM Concept

SCM is rooted in logistics management. This broad idea of coordinated logistics management can be traced back to the mid 19th Century and the writings of a French engineer Jules Dupuit who sought to trade one cost (transportation) for another (inventory) when assessing the virtues of road and water transport (Ballou, 2004). SCM also has roots in the works of;

- Δ Forrester (1958) in his theory of distribution management, who identified that system dynamics can influence the performance of production and distribution entities;
- Δ Bowersox (1969) who further developed the idea of physical distribution management, and
- Δ Farmer (1976), who argued that purchasing should be moved from debates about the technical details of purchasing to a more strategic level encompassing the management of the supply community.

The SCM paradigm itself was developed by authors such as Houlihan in the mid 1980's (1984, 1985 and 1988) and evolved further with the introduction of concepts such as business process reengineering (Hammer and Champly, 1993), Lean Thinking (Womack et al, 1990 and Womack and Jones, 1996) and Mass Customisation (Davis, 1987 and Pine, 1993).

This importance of SCM's influence on organisational strategy has been underlined by authors such as Stevens (1989 and 1990), Christopher (1992), Webster (1992) and Macbeth and Ferguson (1994), among others, who postulate that "competition now takes place between supply chains rather than individual companies in modern marketplaces". In addition, the increasing trend to global sourcing has heightened the need to better coordinate material flows. Recently, authors such as Storey et al (2006) have asserted that the trend in supply management "consciousness" is "accelerating up the corporate agenda".

Despite this increase in popularity and interest there has been considerable debate about what SCM represents in terms of its essence and purpose and how it can be defined (Croom and Saunders, 1995, Croom et al, 2000, Burgess et al, 2006). The next section will reflect on this.

2.2.2.2 The Essence of the SCM Debate

Harland (1996) argues that “a body of research is evolving that defines and discusses SCM as an intermediate type of relationship (between the Buyer and Seller) within a spectrum ranging from integrated hierarchy (vertical integration) to pure market”. This is endorsed by Skjøtt-Larsen et al (2007), who state that SCM has “embraced a concept of direct, extended coordination of operations across the entire supply process, replacing both the market and hierarchy as the means to manage the flow process”. To explore such notions it is perhaps helpful to set the discussion in the context of the theory of transaction cost economics (TCE).

Williamson (1979) did much to crystallise the TCE debate but drew heavily on the work of Coase, (1937). Hines (1997) summarises Coase’s contribution as follows:

“Coase defined a firm not as a production function described in neo-classical economics theory, but as a governance structure of transactions.

Coase concluded that a firm will tend to expand until the costs of organising an extra transaction within the firm are equal to the costs of carrying out the same transactions by means of an exchange on the open market”

(Hines, 1997)

Williamson (1979), building on this work, argues that there are two basic governance structures, which he terms as:

- **Hierarchy** – vertical integration
- **Market** – vertical disintegration

Therefore, a firm is faced with an “either, or” alternative of either making or buying. However, a middle way, termed a “**Network**”, began to be recognised by academics

such as Jarillo (1988) and Nassimbeni et al (1993) (Figure 10). Much was based on the experience of the Japanese who had demonstrated that potentially superior strategy could emerge by engaging in a “Market” structure but with a considerable degree of asset specificity and social sharing (Sako, 1992). Hines (1997) notes that as the concept of this third way, “Networking”, became accepted, numerous advantages began to be determined. These broadly encompass an integrated SCM philosophy and are:

- Δ *Flexibility* (Piore and Sabel, 1984)
- Δ *Technological Development* (Nishiguichi, 1989)
- Δ *Innovation* (von Hippel, 1987)
- Δ *Cost Structure* (Ellram, 1991a)

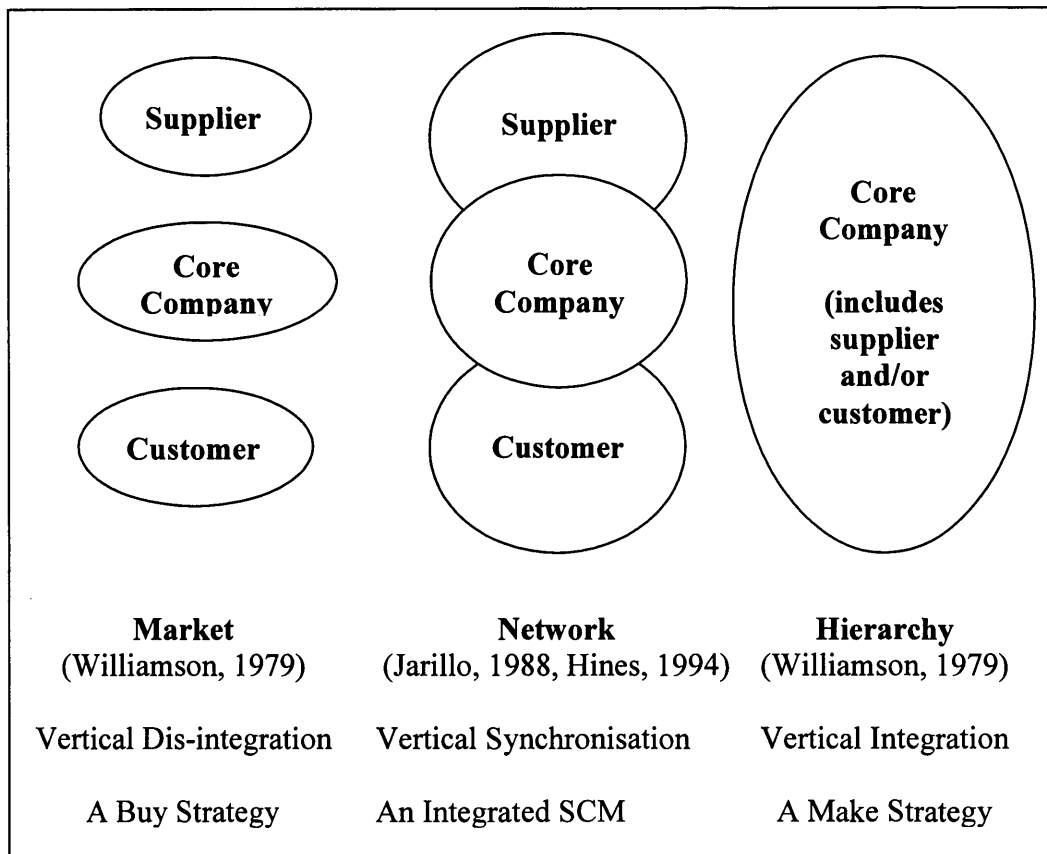


Figure 10: Alternative Governance Structures: theoretical constructs surrounding the network debate

Webster (1992), notes that all are “characterised by flexibility, specialisation, and an emphasis on relationship management instead of market transactions ... the purpose

of these new organisational forms is to respond quickly and flexibly to accelerating change in technology, competition, and customer preferences”.

This concept of “Network” is slightly different to the “supply chain network” discussed above. Networks in this sense can be defined as, “two (dyad) or more agents, at least in part autonomous, which give rise to an exchange relationship, according to certain modalities and forms” (Nassimbeni, 2004).

TCE has been deployed by academics to provide a theoretical foundation to the fundamental choice faced by managers of determining the governance structure. The TCE argument is based upon the inter-play of two behavioural assumptions, bounded rationality and opportunism, with two transaction assumptions, asset specificity and uncertainty. Each of these assumptions is briefly explained below.

Bounded rationality is the concept that there are limits to human behaviour and their capacity to assimilate information. This is important in a neo-classical economic sense in that this theory envisages that the manager of a firm would have full information and perfect knowledge (complete rationality) in their objective to maximise the profit of the firm, by increasing production until marginal revenue equals marginal costs. In reality, individual managers are “boundedly rational” in that they do not know the exact optimums to maximise profitability. So, “human behaviour may be intendedly rational but limitedly so” (Simon, 1957).

Opportunism is defined as the tendency to achieve goals through calculated efforts. These can include the use of guile, and/or various devious or underhand techniques to mislead the other party.

Asset specificity refers to the degree of transferability of an asset within an exchange relationship. The more specialised an asset is to a specific relationship, the more risky it is in that if there is an early termination of a contract the asset cannot be transferred to a different exchange, so a proportion of the value of the investment in that asset is lost. Williamson (1985) identifies four types of assets – site specificity, physical asset specificity, human asset specificity and dedicated assets.

Finally, *uncertainty* is concerned about the predictability of the future. Williamson (1985) divides uncertainty into two types: behavioural uncertainties surrounding the partnering firm's decisions and actions, and environmental uncertainties surrounding the predictability of exogenous factors such as demand and supply levels, developments in technology and so on.

At the core of the TCE concept is the notion that firms can make investments to transact with each other. However, where this investment is in transaction-specific assets the investor may incur penalties if the other party displays opportunistic behaviour. As a caveat to this it should be noted that although not all parties would in reality behave opportunistically it is hard for the investor to fully know whether they are vulnerable or not due to the assumptions of bounded rationality and uncertainty.

Holmstrom and Roberts (1998) have labelled this as the “hold-up problem”. Where the risk of a “hold up” is high the Buyer is more likely to pursue a make rather than a buy strategy so vertical integration through ownership (a hierarchical approach in Figure 10) would be preferable (Williamson, 1985). However, if the opposite is true and the asset specificity is low then the risks attached to opportunistic behaviour are small and the Market approach is more efficient (Williamson, 1985).

The decision to make or buy is thus a choice determined by efficiency – minimising the costs involved in the planning, adapting, coordinating and safeguarding the exchange. TCE therefore can be used in terms of the efficiency motive to explain why firms may go into inter-organisational relationship arrangements. SCM is the hybrid mode of governance between markets and hierarchies (Figure 10). In this mode, trust, which may exist between the parties, is based on “calculated risk” and not on personal risk between individuals (Williamson, 1996).

2.2.2.3 SCM for Effectiveness or Efficiency?

It is important at this juncture to briefly discuss one of the biggest criticisms of the TCE theory and reflect on what constitutes customer value. TCE takes efficiency, or cost minimisation as being the core value motive to explain behaviour and decision making surrounding the governance alternatives faced by managers of the firm. This

is derived from neo-classical economics which assumes that optimal cost decisions will produce profit maximisation which economists argue is the goal of the firm.

Hunt and Duham (2002) explain, “neo-classical economists argue that ... competition is exclusively, an efficiency-seeking enterprise ... competitors are profit maximisers, who produce homogeneous products by combining homogeneous resources under conditions of perfect information. If a firm produces a product having more value than its rivals this results in product differentiation and monopolistic competition in the industry”. As neo-classical economists believe there are no lasting barriers to entry (except perhaps those imposed by a higher authority, such as a government body), any firm can sooner or later make the same move. So in the long run natural competition will erode any advantage away and the equilibrium of perfect competition will be restored.

- | | |
|--|--|
| <ul style="list-style-type: none"> • Meeting Customer Requirements • Fitness for Use • Process Integrity • Minimum Variances • Elimination of Waste • Continuous Improvement | <ul style="list-style-type: none"> • Customer Support • Product Service • Product Support • Flexibility to Meet Customer Demands • Flexibility to Meet Market Changes |
|--|--|

$$\text{Value} = \frac{\text{Quality} \times \text{Service}}{\text{Cost} \times \text{Cycle Time}}$$

<ul style="list-style-type: none"> • Design and Engineering • Conversion • Quality Assurance • Distribution • Administration • Inventory • Materials 	<ul style="list-style-type: none"> • Time to Market <ul style="list-style-type: none"> - Concept to Delivery - Order Entry to Delivery • Response to Market Forces • Lead Time <ul style="list-style-type: none"> - Design - Conversion - Engineering - Delivery • Materials • Inventory
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Figure 11: The Value Equation showing Customer Value Criteria (Johansson et al, 1993)

However, many authors take a wider view and argue that cost minimisation may not necessarily equate to value maximisation. For example, Zajec and Olsen (1993), as cited in Cousins et al (2006), suggest that “the value created in a transaction may be greatest under circumstances that may, from a TCE perspective, appear inefficient”.

Indeed, it is important to reflect on the fact that there can be a difference between improved efficiency and improved effectiveness. This can be explained through Johansson et al's (1993) "Customer Value Criteria" (Figure 11).

This equation illustrates that cost reduction is only one possible dimension of potential value enhancement. Other dimensions include improvements in service or better cycle time, or enhanced quality, or a combination of any of these elements. (In addition, as will be explained in Chapter Four, two new dimensions could also be added: health and safety, and the environmental impact.)

With value built up from a number of facets it reinforces the view that value is not synonymous, on all occasions, with the cheapest price or improvements in efficiency. "At every step in the creation of value, competition is fierce" (Fuller et al, 1993) and the customer wants value to be maximised, but this may not just be derived from lower costs! Zokaei and Hines, 2007 endorse this stating that, "better SCM should not be limited to efficiency improvement by removing costs but also should be about improving effectiveness beyond efficiency in terms of better service, quality and or time dimensions". This also concurs with conventional business wisdom which sees that, "competition in the third millennium will primarily be an effectiveness-seeking enterprise.....that is business success will depend crucially on innovations which enable firms to deliver more value to customers than their competitorsproducing superior profits and... therefore social welfare" (Hunt and Duhan, 2002).

This presents an important challenge to the theory of TCE (and to the wider neo-classical economics field) in explaining behaviour surrounding governance decisions. One can conclude that SCM should be about improved effectiveness, which may, or may not include improved efficiency by removing costs and that TCE can only at best provide a partial explanatory theoretical basis for SCM.

This then is the essence of the SCM debate. Strategies adopted in this "middle way" between Hierarchy and Market can lead to value improvements through efficiency by providing solutions to the issues of duplication and/or also in other value attributes through enhanced responsiveness, better service and/or flexibility, thus providing the potential for improvement in effectiveness. Thus, "directing interaction (between

supply chain members) becomes the purpose of SCM” (Skjøtt-Larsen et al, 2007). Through SCM, “the supply chain becomes an organisation in its own right, a supra-organisation, linking the operations of its members” (Skjøtt-Larsen et al, 2007).

Whilst the essence of SCM may be clearer the exact domain and definition now needs to be explored and clarified. This is again not a straight forward task.

2.2.2.4 SCM: The Domain and Definitions

The first issue derives from the multi-discipline background of SCM. Although, as was mentioned at the outset of 2.2.2.2, the original roots of SCM trace back to logistics management in the nineteenth century, in fact the school of early proponents in the 1980’s (Baily and Farmer, 1990, Kraljic, 1983) emerged from purchasing practitioners and academics who argued that purchasing should be moved from debate about the technical details of purchasing to a more strategic level encompassing the management of the supply community. In addition, apart from obviously logistics, other academic fields where SCM has its roots include marketing, economics, organisational behaviour and strategy to name but a few. This has contributed as well to the many alternative interpretations and debates in recent years about the specific domain and definition of SCM, which is useful to reflect on here.

Croom et al, (2000) propose that SCM should not just be labelled as a concept or an ideal, but instead should be seen as a discipline, citing that, “... disciplines are distinguished by the general (discipline) problem they address” (Long and Dowells, 1989 cited in Tranfield and Starkey, 1998). This view is also supported by one of the pioneers of logistics and SCM, Professor Donald Bowersox (2007) in Mangan et al (2008). He states, when reflecting on the question over whether SCM is a discipline or not, that, “SCM is a discipline because it offers an integrated body of knowledge to guide research and practice”.

However, others diverge from this view explaining that despite considerable attention from practitioners and academics no consensus currently exists surrounding an agreed definition and domain and hence at best it should be termed as an “emergent” rather than a mature discipline (Cousins et al, 2006 and Harland, et al, 2006). Support for this thinking is reinforced by Burgess et al (2006) who concludes that, “despite its

popularity in both academia and practice, SCM is a nebulous term with little consensus surrounding what it means or how it should be defined or delineated”.

This is not surprising as supply chains come in many configurations and the SCM concept itself is relatively new and emerging. The confusion, however, it is argued, has hampered its conceptual development as a genuine discipline and made it difficult to work with in research studies which are focussed on the SCM domain.

Storey et al. (2006) note that some authors take a very narrow view of SCM, labelling it as indiscernible from purchasing (Stuart, 1997), or even logistics. Only marginally up from this, others see it as being about purchasing specialists managing relations with their suppliers (Giunipero and Brand, (1996). This extends up to authors such as Davis (1993) who take a holistic view and conceive of SCM as a wider end-end notion from raw material to end-consumer including freight transportation and logistics.

Mentzer et al (2001) categorise SCM into three groupings: “SCM as a philosophy”, “SCM as a set of activities”, and “SCM as a set of management processes”. In essence all have some credibility and perhaps this is the issue. SCM has become an all encompassing term that can be seen as a catch all phrase for all supply chain development issues.

As an indication of the wide ranging spectrum of understanding that was and is evident in SCM a range of alternate definitions are given below:

- Δ *“an integrative approach to dealing with the planning and control of the materials flow from suppliers to end-users”* (Ellram , 1991a);
- Δ *“the integration and management of supply chain organisations and activities through cooperative organisational relationships, effective business processes, and high levels of information sharing to create high performing value systems that provide member organisations a sustainable competitive advantage”* (Handfield and Nichols 2002);
- Δ *“an integrative philosophy to manage the total flow of a distribution channel from supplier to ultimate user”* (Cooper et al, 1997b);

- Δ *“the systemic, strategic coordination of the traditional business functions and the tactics across these businesses within the supply chain, for the purpose of improving the long term performance of the individual companies and the supply chain as a whole”* (Mentzer et al, 2001);
- Δ *“the management of a network of organisations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer”* (Christopher, 1992);
- Δ *“(the management of) a network of entities that starts with the suppliers’ supplier and end with the customers’ customers for the production and delivery of goods and services”* (Lee and Ng, 1997);
- Δ *“the design, maintenance, and operation of supply chain processes for satisfaction of end users”* (Ayers, 2001);
- Δ *“a set of approaches utilised to efficiently integrate suppliers, manufacturers, warehouses and stores, so that merchandise is produced and distributed in the right quantities, to the right locations and at the right time, in order to minimise system wide costs while satisfying service level requirements”* (Simichi-Levi et al 2000);
- Δ About aiming *“at building trust, exchanging information on market needs, developing new products, and reducing the supplier base to a particular original equipment manufacturer (OEM) so as to release management resources for developing meaningful, long term relationships”* (Berry et al, 1994)

In critically analysing these definitions it becomes clear that some explicitly refer to SCM’s focus as managing the material flow, thus aligning the concept more closely with definitions for logistics management, whilst others take a wider perspective. They state that SCM can be envisaged as a set of management processes, which although including the material flow and related processes such as information flow for ordering, also include other processes such as new product development, joint range and promotion planning, strategic planning, and so on. Thus a distinction can be drawn between what can be termed as SCM logistics and SCM in general.

Indeed, clarifying how logistics is distinct from SCM and how each can support each other is a useful exercise in laying the foundations for a study such as this. Larson and Halldorsson (2004) completed an international survey looking at just this issue. They identified four distinct perspectives (Figure 12) in how logistics managers, researchers and educators viewed the relationship between logistics and SCM. These were labelled as the:

- △ *Traditionalist* View - those who viewed SCM as a subset of logistics;
- △ *Re-labelling* – those who viewed the terms as inter-changeable;
- △ *Unionist* – those who viewed logistics as a sub-set of SCM, and
- △ *Inter-sectionist* - those who viewed logistics and SCM as separate concepts but with common elements (they also viewed SCM as more strategic and although logistics may not report to an SCM manager or director, they might draw on the SCM group for research, intelligence or consulting report).

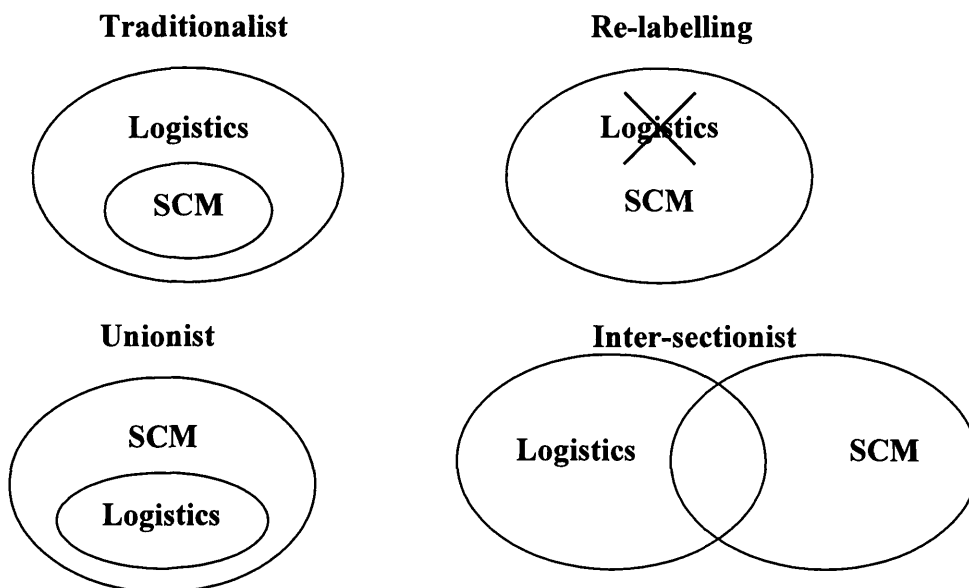


Figure 12: Perspectives on Logistics versus SCM (Larson and Halldorsson, 2004)

Although some academic authors argue that there is not much difference between SCM and logistics (Cooper et al, 1997b), the “Re-labelling” view, other academic authors tend towards the “Unionist” view envisaging that SCM is broader in its conceptualisation than logistics (Stank et al, 2005, Johnson and Wood, 1996). Giunipero and Brand (1996) state that, “CEOs of companies leading the drive to

implement SCM visualise the necessity to go beyond the logistics function and focus on making business processes more effective and efficient.” Lummus et al (2001) concludes, after an indicative survey of professionals in industry, that “supply chain management is not another name for logistics”. Indeed, when each of the pertinent processes in SCM is listed it is clear that in the supply chain, logistics is only a subset of SCM. This is endorsed by leading academics in the field of logistics and SCM. For instance, Mangan et al, (2008) in their recent book on Global Logistics and Supply Chain Management state that, “in our book our approach is to adopt the unionist view”.

Stock and Lambert (2001) add weight to the view that SCM encompasses a wider entity of activities than logistics suggesting that “SCM is the management of eight key business processes:

- (1) customer relationship management,
- (2) customer service management,
- (3) demand management,
- (4) order fulfilment,
- (5) manufacturing flow management,
- (6) procurement,
- (7) product development, and
- (8) returns”.

Mentzer et al (2001) concur, envisaging that SCM also includes sales, research and development, forecasting, production, information systems, finance and customer service – all traditional business functions.

SCM can then be greater than logistics if a more general definition of SCM is taken. Therefore, the logistics element is just one part of the multi-faceted Buyer – Seller relationship, as will be examined below in Relationship One of the Logistics Triad between the Buyer and Seller.

2.2.2.5 The Purpose of SCM

One of the areas where again there is not an alignment of view is over the purpose of SCM. For example, if the definitions of SCM given above are examined closely a range of reasons for SCM occurring are given

- Δ *“to create high performing value systems that provide member organisations a sustainable competitive advantage”* (Handfield and Nichols 2002);
- Δ *“for the purpose of improving the long term performance of the individual companies and the supply chain as a whole”* (Mentzer et al, 2001);
- Δ *“that produce value in the form of products and services in the hands of the ultimate customer”* (Christopher, 1992);
- Δ *for the production and delivery of goods and services”* (Lee and Ng, 1997)
- Δ *“for satisfaction of end users”* (Ayers, 2001);
- Δ *“in order to minimise system wide costs while satisfying service level requirements”* (Simichi-Levi et al 2000);
- Δ *so as to release management resources for developing meaningful, long term relationships”* (Berry et al, 1994)

Interestingly, it is realistically only Christopher (1992) and Ayers (2001) who explicitly mention that the purpose of SCM is to generate improvements for the end users of the product or services. Others mention improving more internalised benefits for the participating organisations or the supply chain itself. Some do not give a purpose at all, for example:

- Δ *“an integrative approach to dealing with the planning and control of the materials flow from suppliers to end-users”* (Ellram , 1991a);
- Δ *“an integrative philosophy to manage the total flow of a distribution channel from supplier to ultimate user”* (Cooper et al, 1997b)

This poses a problem. If the purpose of SCM cannot be defined, how can the supply chain be properly designed round SCM thinking, what are the measures critical to providing assurance that it (SCM) is working properly, and how can feedback be focussed effectively on successful continuous improvement?

Evans et al, (2007) reflect on this and conclude that SCM needs to be defined so that “the customer is at the root of good supply chain practice”. They cite companies like Tesco which, they argue, is obsessed with this idea. “The simple notion of understanding their customers and providing exceptional convenience, to Tesco, is at the heart of everything that the company does.” They add however, that this is, “not just about getting the cost down ...nor even just about improving availability..... SCM is about strategically understanding consumer value and aligning all supply chain activities with the inclusion of marketing elements, emotional value and consumer loyalty”. This argument fits with the view that SCM is about effectiveness enhancement, which may or may not be derived from efficiency improvements discussed above.

This also fits more closely with Porter’s (1985) value chain which includes marketing in the value adding activities. The customers’ experience of value is made up of many dimensions: customer care, ease of purchase, quality and service, branding, packaging, advertising features, and end-of-life management (Meyer and Schwager, 2007). Effective management of the supply chain is a contributor, yet not the only producer of customer value.

In conclusion, one could argue that the more unified purpose of SCM, which most academics subscribe to, is to improve the effectiveness of the supply chain operation. How these benefits are then apportioned, to improve or sustain margins for the protagonists, or for the leading supply chain entity, or for the immediate customer, or the end customer, or all of the entities involved, is a more contingent debate to be determined in each case.

2.2.2.6 SCM: A Supply Chain Orientation

The SCM concept as the basis for a competitive strategy (Christopher, 1992) has been seriously argued for roughly the last two decades since it was first coined by Oliver and Weber (1982). Harland et al (1999) developed the notion of supply strategy, explaining that supply strategy goes beyond the more specific concepts of operations management and operations strategy and also incorporates logistics, purchasing and supply management, industrial relationship marketing, and service management.

Mentzer et al (2001) argue that firms who undertake this approach possess a “supply chain orientation” (SCO), which they define as follows:

“... the recognition by a company of the systemic, strategic implications of the activities and processes involved in managing the various flows in a supply chain”.

(Mentzer, et al 2001)

Stank et al (2005) point out that this orientation “differs from other orientations such as customer orientation, product orientation, or competitor orientation in that it stresses a systemic view stretching beyond the focal firm to include the coordination of business processes and flows with those of other members of the supply chain for the purpose of creating a strategic advantage based on end-customer delivery”.

Mentzer et al (2001) state that a firm adopting a SCO will possess:

- 1 *“A systems approach to viewing the channel as a whole, and to managing the total flow of goods inventory from the supplier to the ultimate customer;*
- 2 *A strategic perspective focussed on cooperative efforts to synchronise and converge intra-firm and inter-firm operational and strategic capabilities into a unified whole;*
- 3 *A customer focus, to create unique and individualised sources of customer value leading to customer satisfaction.”*

Storey et al, (2006) note that this is akin to the strategic management literature associated with supply partnerships. A considerable volume of academic literature has been devoted to identifying and describing theories that can explain why pursuing an inter-relationship strategy can provide a powerful means of achieving a competitive advantage. This will be developed further at the end of this Literature Review when a range of theories relevant to the logistics triad concept will be examined in more detail.

2.2.2.7 Conclusions

At the outset of this section the importance of conceiving of logistics provision, and therefore the logistics triad, within the supply chain, consequently influenced and shaped by SCM strategies, was emphasised. The discussion about the supply chain and SCM has revealed that although it has become more popular for practitioners to base strategies around process, and for academics to research SCM, there is still a significant level of confusion and ambiguity surrounding exactly how the supply chain should be conceptualised and what SCM definitively stands for. Yet the essence of what the supply chain is and what SCM thinking is about is hopefully clearer: “the supply chain encompasses organisations and flows of goods and information between organisations from raw materials to end-users” (Handfield and Nichols, 2002): the management of this (SCM) refers to inter-organisational relationship management whose purpose is to improve value for the end-consumers and where possible also profitability of activities and therefore the organisations involved. It includes the integration of business processes and requires the coordination and interaction of decision makers across a supply system often between economic institutions (company boundaries).

The significance of SCM is also clearer. As Giunipero et al, (2006) note, “business executives recognise that strategic purchasing is one element of an organisation’s competitive weapons and must be aligned with suppliers and customers across the supply chain”. They argue that this makes SCM more strategic and thus it should now involve, “supplier coordination, supplier development, supplier market research, cost analysis, sourcing strategy formulation, benchmarking and outsourcing decisions”. In short SCM is “moving from an administrative function to a strategic one” Giunipero et al, (2006).

This provides the foundations for the study in that it emphasises that as a core process of SCM the management of logistics is also strategic (as well as operational). If logistics provision is not reliable, if it cannot cope with the demands placed on it, if it lacks quality in its provision, if it cannot cope with the unexpected then the whole supply chain and any supply chain based (SCM) strategy will be broken.

The section has also supported the proposition that no firm is an island, and that “an increasing proportion of value creation takes place outside the boundaries of the firm” (Halldorsson, A. et al 2007). Business processes are clearly not just restricted to the boundaries of the firm and consequently, as Drucker (1965) and more recently Hammer (2001) both suggest, enhanced value has been sought in the “economies dark continent”, beyond the walls of the firm itself. From this way of thinking, the concept of SCM has emerged. Logistics, as a core business process, engages with this, linking with the “complexities of synchronising the movement of materials and information” (Harrison and van Hoek (2008)).

The next section builds from this foundation and looks at each of the constituent relationships within the logistics triad in turn. The first relationship which will be focussed on is Relationship One between the Buyer and Seller – the relationship that is firmly rooted in the constituent supply chain and represents the foundation of all logistics triads.

2.3 Relationship 1: The Buyer – Seller Interface

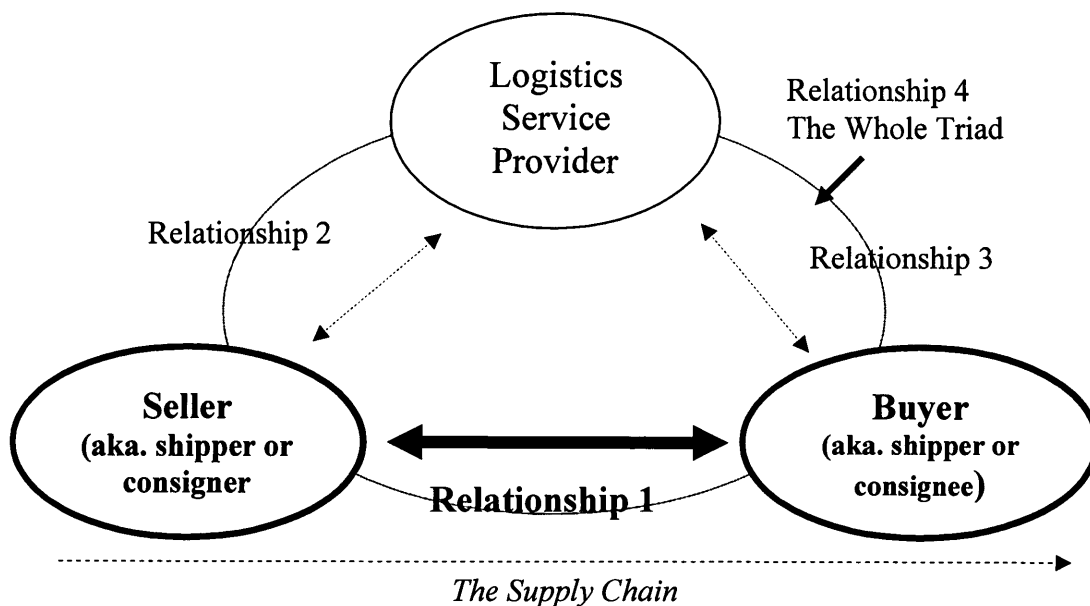


Figure 13: The Logistics Triad highlighting Relationship One

2.3.1 Introduction

“The need for an integrated network places an increasingly important emphasis on buyer-supplier (seller) relationships as a potential source for efficiency gains as well as for competitive advantage through strategic alliance arrangements”

(Whipple and Frankel, 2000).

Relationship management is clearly at the core of SCM. Four relationships are inherent in the logistics triad: three dyadic relationships and one tripartite relationship. The Literature Review now takes each of these four relationships in turn. The first interface which is examined is Relationship 1, the Buyer – Seller dyadic relationship. This is the founding relationship at the core of all logistics triads as it links the so-called primary members of the supply chain - the supplying organisation and their customer (Lambert and Cooper, 2000). The Literature Review on this interface will be structured as follows. First, the spectrums of potential relationship types are presented. Next, the various terms and definitions deployed in this area are clarified for the purposes of this study and the scope of Buyer – Seller relationship management discussed. Finally, the antecedents to successful collaborative partnerships are explored and conclusions reached.

2.3.2 Collaboration and the Relationship Spectrum

“Most of yesterday’s highly integrated giants are working overtime at splitting into more manageable, more energetic units – i.e. de-integrating.

Then they are turning around and re-integrating not by acquisition but via alliances with all sorts of partners of all shapes and sizes.”

(Peters, 1992)

Traditionally, businesses undertook exchange on a basic transactional footing akin to the Market categorisation outlined in the left hand column of Table 2. The focus was on single product transaction and involved limited information sharing (Jagdev and Thoben, 2001). Skjøtt-Larsen et al (2003) noted that, “the 1970’s and 1980’s were characterised by such trade exchanges, which involved tough price negotiations where Seller and Buyer looked at their customers and suppliers as adversaries that had

to be squeezed as much as possible to increase the individual company's profit margin". Spekman et al, (1998) added the objective was, "achieving the lowest initial purchase prices while assuring supply". This meant developing "multiple partners, partner evaluations based on purchase price, cost-based information bases, arms length negotiations, formal short-term contracts, and centralised purchasing" (Spekman et al, 1998). If one supplier fell below the standards expected they were then simply replaced by a competitor, thus keeping value supplied high through the threat of substitution.


	Transactional View of Supply Chain (Market)		Collaborative View of Supply Chain (Network)
Number of Suppliers	Multiple	The Supply Chain Management Spectrum 	Consolidated
Partner Evaluations	Efficiency Focused		Effectiveness and Efficiency Focussed
Inter-relationship Classification	Adversarial		Partnering
Contract Length / Type	Short / Open Book		Long / Closed Book
Orientation	Production Orientated		Customer Orientated
Focus	Functional Optimisation		Process Optimisation
Culture	Suspicious		Trusting

Table 2: Contrasting the Transactional and Collaborative Views of Managing the Supply Chain (developed from Spekman et al, 1998 and Skjøtt-Larsen et al, 2003)

With the emergence of a more process orientated stance and the development of SCM thinking in the 1980's, 1990's and through this decade, inter-business relationships began to radically change. This new thinking and attitude brought with it a, "realisation that simply maximising gains in individual transactions was a flawed and short-term strategy" (Wagner et al, 2002 – based on Imrie and Morris, 1992). The modern SCM concept, as outlined in the previous section, led to a redefinition of how to optimise value from the supply system. This incorporated "the process for

designing, developing optimising and managing the internal and external components” and included “material supply, transforming materials, and distributing finished products or services to customers” (Spekman et al, 1998).

Skjøtt-Larsen et al, 2003 highlighted that one of the major obstacles to pursuing effective collaboration was the traditional functional approach which may still have been present in an organisation:

“a successful (collaborative) implementation requires that the company abandons the classical functionally divided organisation based on production-orientated vision... ..the organisation must become market-orientatedthe traditional organisational structure, where the functional departments, e.g. procurement, production, sales and logistics, have individual and often conflicting goals creates a weak basis for process orientation” (Skjøtt-Larsen et al, 2003).

Hence it was argued that competing firms and supply chains which managed through a more process orientated and collaborative approach to integrate supply and demand delivered significantly improved performance through a better optimised holistic supply system. Whipple and Russell (2007) summarised these improvements which included “increased sales, improved forecasts, more accurate timely information, reduced costs, reduced inventory, and improved customer service”. This notion of integration implied that some of the benefits of ownership could be realised without some of the burdens of ownership being incurred.

“At the core of the issue of vertical integration is the argument that surrounds the decision over whether it is best to make or buy. If the decision is to buy, then closer business relationships are a way of providing some of the benefits of internalising the supply process without incurring the risks and costs involved.”

(Barratt, 2004)

Mentzer et al. (2000) used the term “partnering” to cover this family of closer inter-relationship forms between firms. They proposed that in the correct circumstances partnerships helped to deliver sustainable competitive advantages, although they were costly in time and money. Other names were also used, such as “alliance”.

“Alliances offer the benefits of vertical integration without the investment of physical and human resources associated with ownership”
(Whipple & Frankel, 2000)

Linked to this was the trend to reduce the supplier base. The concentration of suppliers was an issue that Lamming (1989) had noted differentiated the Japanese lean producers (who typically had fewer than 300 suppliers involved in new product development) from western manufacturers, who traditionally dealt with 1000-2500 suppliers. Harland and Knight (2001) identified supplier base reduction as being a key trend which was leading to a heightened interest in relationship management as firms sought to ensure they were managing the remaining interfaces to best effect.

In reflecting on this evolution, many authors drew up conceptualisations to show how they envisaged a spectrum of relationship types (see Spekman et al, 1998 - Figure 14 and Harland 1996 – Figure 15) from the open *Market* on the one hand to a continuum of various relationship types within the *Network*. Beyond this could also be plotted forms of joint ownership such as joint venture and equity interest before a final alternative was to return to fully owned vertical integration through acquisition.

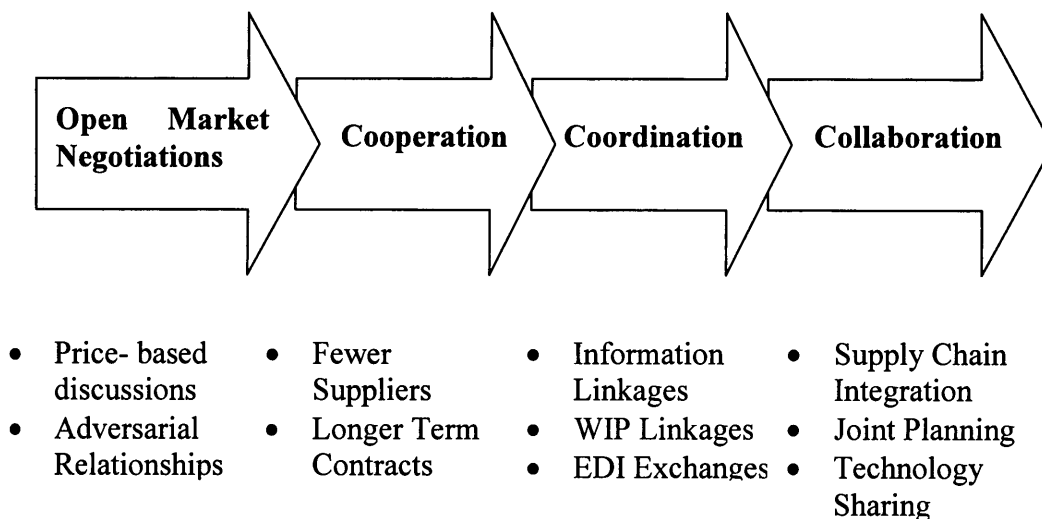


Figure 14: The Inter-Organisational Relationship Spectrum (Spekman et al, 1998)

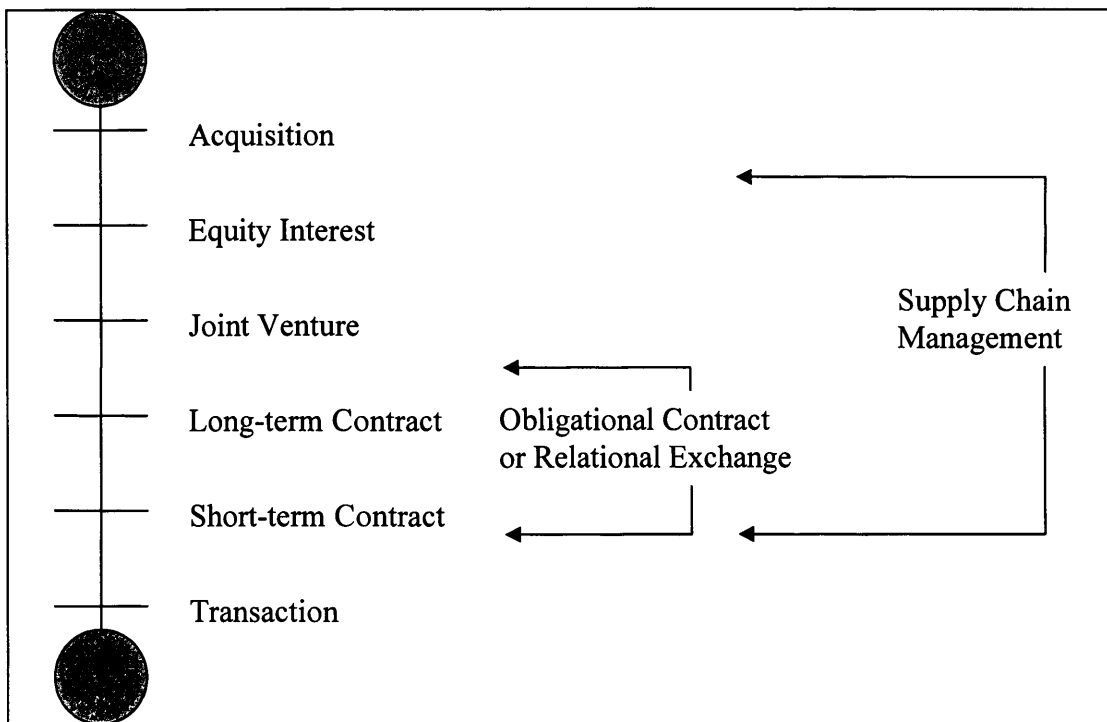


Figure 15: SCM as a Type of Relationship (Harland, 1996)

Webster (1992) also proposed a categorising continuum from pure transactions at one end to fully integrated hierarchies at the other (Figure 16). He argued that further along the spectrum, “firms used more administrative and bureaucratic control and less market control in the pursuit of market efficiency” (Webster, 1992). The first three categories were characterised by a more adversarial relationship with negotiations depending heavily on market control. On categories four to seven partnering was more prominent in that prices were determined by negotiation, but still with some market pressure; rather than the by the market itself. Strategic alliances incorporated more multi-faceted inter-relationships than just transaction and this could evolve to a networked arrangement, which Webster (1992) defined as organisations which were “the corporate structures that result from multiple relationships, partnerships, and strategic alliances” – *the keiretsu* as they were known in Japan.

Gentry (1996) synthesised various research findings on partnerships and concluded that closer collaborative Buyer – Seller inter-relationships she termed as strategic alliances, contained four characteristics:

- Δ An increased quality emphasis;
- Δ Cooperation on cost reduction programmes and continuous improvement;
- Δ Exchange of information and open communication;

△ A long-term approach including the sharing of risks and rewards of the relationship

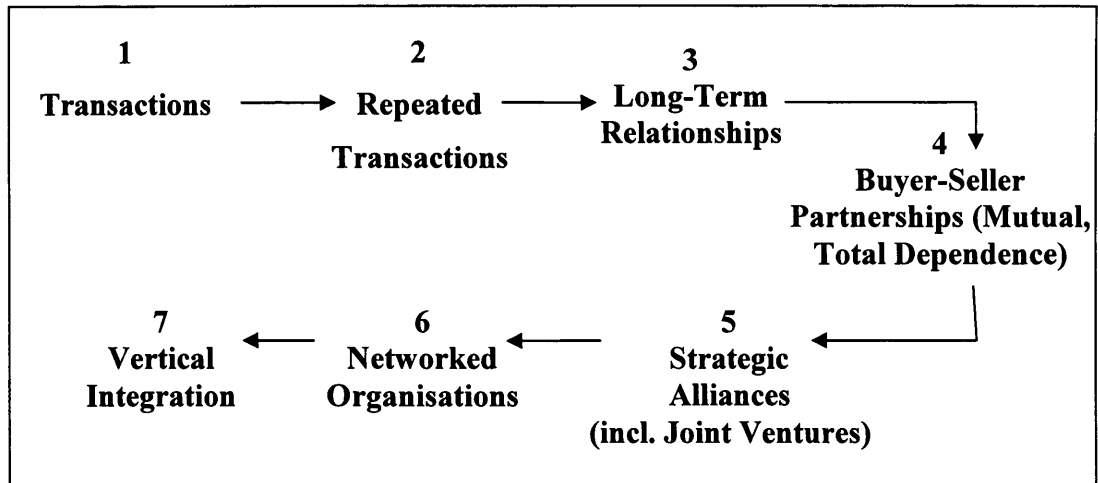


Figure 16: The Range of Marketing Relationships (Webster, 1992)

Over the last decade there have been attempts to better understand how to optimise closer inter-business relationships in practice and to take the collaborative model further. These have been led by movements such as ECR (Efficient Consumer Response) in the grocery sector, and VICS (Voluntary Inter-Industry Commerce Standards). Initiatives such as Vendor-Managed Inventory (VMI) and Continuous Replenishment (CR) have been translated into practice within more comprehensive concepts such as CPFR (Collaborative Planning Forecast and Replenishment), which, as the name suggests, contains a more wide ranging collection of cross business ideas.

Whipple and Russell (2007) in a study of current CPFR practices in the grocery sector classified collaborative ventures into a typology of three types:

Type I - Collaborative Transaction Management - is the most basic form of collaboration in that it focuses on the day to day management of the core supply process addressing the operational level of decisions. Interaction is often limited to a person-to-person level restricted to information hand-over with decision making largely being independent and separate of the other entity.

Type II - Collaborative Event Management - focuses more strategically on out of the ordinary events. It emerges from a recognition that stock-outs are more likely to occur

at these times when events such as seasonal peaks (or troughs), promotions or new line introductions occur or business plans for a season are being drawn up. Planning horizons are more mid-term and interaction is more managerially focused. There is also more likely to be joint decision making. The stance is more proactive with an orientation to try and prevent problems by identifying and resolving perceived issues before they become serious disruptions.

Finally, **Type III - Collaborative Process Management** - focuses on the demand and supply processes at a more aggregate level, incorporating both sales and order forecasting. Collaboration on demand processes (such as new product introductions, customer demand forecasting) is managed in conjunction with supply processes (manufacturing and production scheduling, vehicle and warehouse management, order forecasting) so that better optimised supply decisions can be reached.

Whipple and Russell (2007) concluded that the three distinct types of collaboration existed and posed the question for managers, “when was a particular collaborative type suitable and when was it not?” This is an interesting insight which will be reflected upon later in Relationship 2 in this Literature Review. What is important to understand from a logistics triad perspective is to what degree the management of logistics provision is a constituent element of each category type.

What these typologies emphasise is an important point which was introduced in the discussion of the supply chain above and should be reinforced here. This is the concept that SCM can clearly be much more than just logistics if a more general definition of SCM is taken. The logistics element is just one process of the multi-faceted Buyer – Seller relationship, although many of the other interfacing activities may have a bearing on logistics. Thus the relationship in Relationship 1 is clearly not focussed on logistics matters alone, despite the fact that material storage and movement between the two entities is important. This breadth of issues in Relationship 1 is summarised in Figure 17.

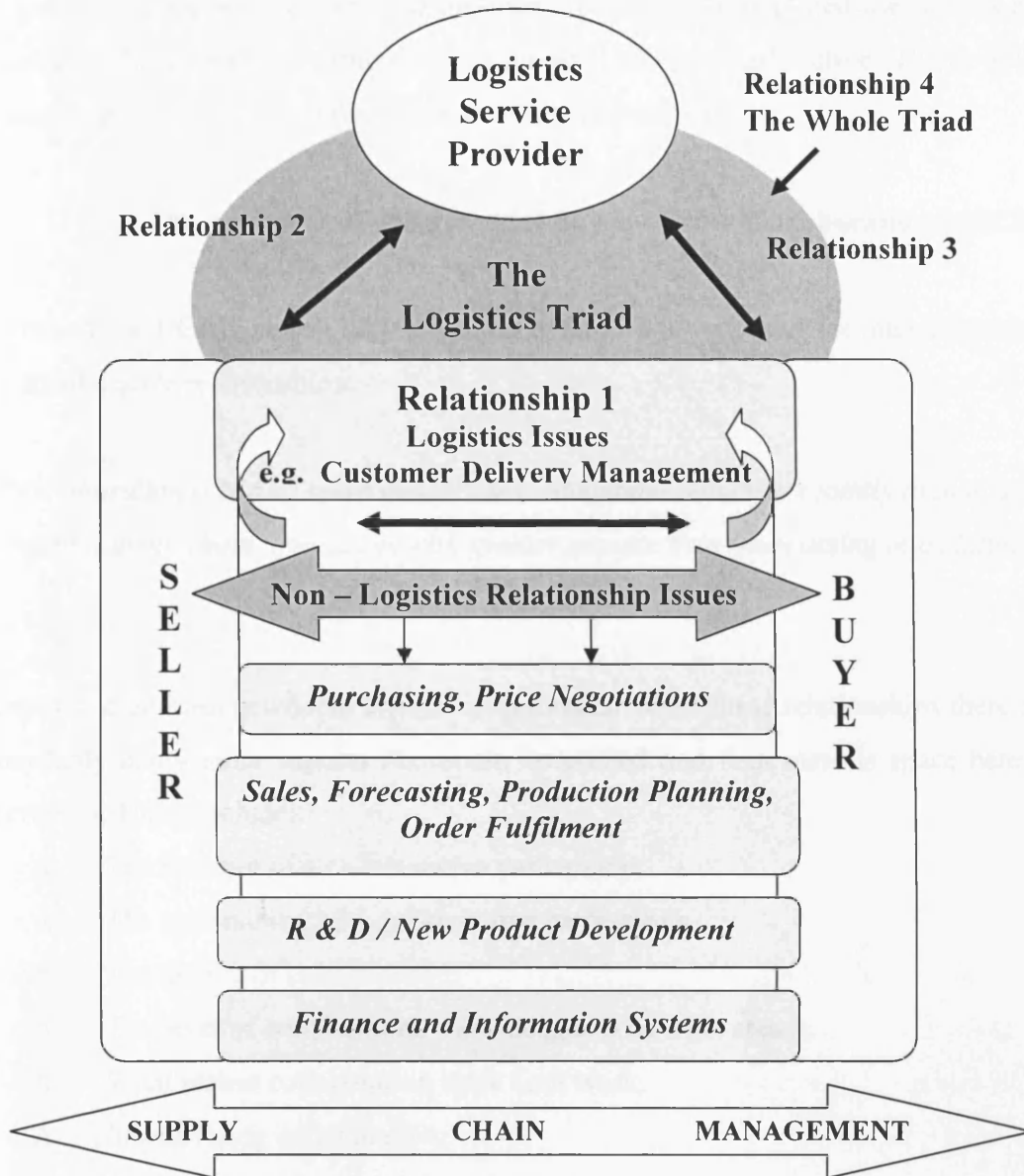


Figure 17: The Buyer-Seller Relationship and the Logistics Triad: logistics is just one of many processes which need to be managed in the Buyer-Seller interface

Finally, it should be noted that although a supply chain orientation is a significant driver of the adoption by firms of a more collaborative stance it is not the only reason why firms may choose this strategy. Other factors include a firm's lack of resources, such as in skills, technology, capital, or for market access reasons (Brouthers et al, 1995).

In pursuing a supply chain orientation, many authors have explored the drivers and barriers which may determine the outcome of a collaborative Buyer-Seller arrangement. This will be reflected upon in the next section.

2.3.3 The Antecedents of Successful Buyer – Seller Collaboration in SCM

In this study a fairly simple all-embracing definition is proposed for inter-dependent or collaborative relationships:

“collaboration is two or more independent companies, who work jointly to plan and execute supply chain operations with greater success than when acting in isolation”

(Simatupang & Sridharan, 2002)

Due to the multi-dimensional aspects of collaborative business relationships there are inevitably many more aspects that could be probed into than there is space here to devote to. These include:

- Δ The forming of a collaborative partnership;
- Δ The maintaining of a collaborative partnership;
- Δ The degree of collaboration;
- Δ The level of collaboration (how deep and on what areas);
- Δ What makes collaboration work / not work;
- Δ Incentivising collaboration;
- Δ The importance of a collaborative culture;
- Δ The issue of power balance or imbalance;
- Δ How many tiers does it span over;
- Δ Adopting a segmented approach to collaboration

However, a brief overview of the antecedents to successful Buyer – Seller collaboration is important to understand, when researching the wider concept of the logistics triad. As interest in closer relations grows there is a growing awareness that creating, developing and maintaining successful partnerships are daunting tasks (Whipple and Frankel, 2000). Many authors have cited low success rates for inter-firm collaborative ventures, for instance, Harrigan (1988) and Day (1995).

Barratt (2004), lists a number of potential barriers which have been cited by authors as being some of the fundamental causes of failed collaborative initiatives. In paraphrased form these are listed below:

- △ Each organisation has its own plans and priorities;
- △ Organisations often upset demand with unnecessary promotions;
- △ Many organisations run functionally;
- △ Many organisations do not know their own processes;
- △ Many organisations are run in a top down fashion - not conducive to process collaboration – internally or externally;
- △ Many organisations have differing supply chain metrics in place;
- △ Supply chain measures invariably are not shared with partners;
- △ Information overload;
- △ No continuous improvement – the same mistakes are repeated;
- △ Poor conceptualisation of when to collaborate and to whom, and
- △ Lack of scalability

When this list is analysed it can be seen that many of the issues are organisational (e.g. concerning organisational culture and reengineering the business process). Whipple and Frankel (2000) concur with this, concluding that this category is the most significant barrier to collaborative success. In this regard, people development is critical - yet this can be very costly, and success does not hinge solely around interpersonal attributes, they argue. Collaborative success must also include improved performance.

“Win-win has both a “soft” people oriented focus as well as the need for a “hard” performance oriented improvements. In this sense, performance and “people skills” interact to determine the viability and success of an alliance”

(Whipple and Frankel, 2000)

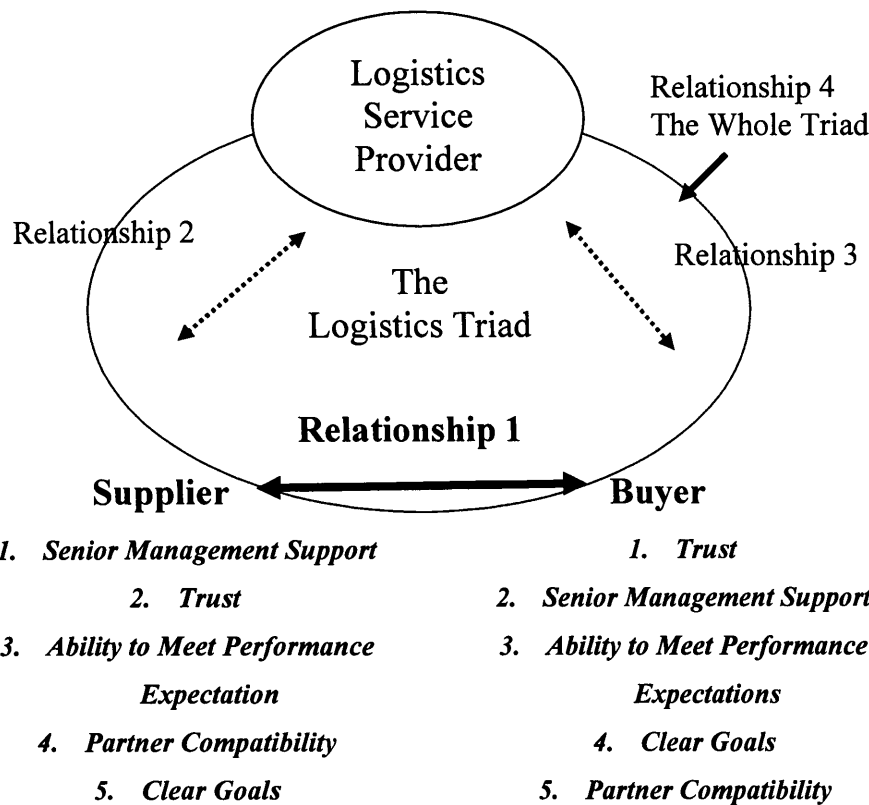


Figure 18: Buyer-Seller Alliance Success Factors - top five factors that influence success (developed from Whipple and Frankel, 2000)

Whipple and Frankel (2000) surveyed Buyers and Sellers and found that the five most key attributes, out of a possible list of eighteen factors, were exactly the same from both groups, although the order of importance was slightly different (Figure 18).

These five factors will be explored below and were:

- Δ The presence of trust;
- Δ Senior management support;
- Δ Ability to meet performance expectations;
- Δ Clear Goals;
- Δ Partner Compatibility

2.3.3.1 The Presence of Trust

Trust is a critical antecedent to successful relationship management. Nooteboom (1999); cites that the presence of trust is helpful in two areas; avoiding costs incurred due to the monitoring of the other party and/or the searching for evidence of opportunism which can occur in the absence of trusting relations. The aim should be

to develop trust and respect through improved certainty and reliability (Whipple and Frankel, 2000). To be trusting of another entity increases one's vulnerability to the potential opportunism of the other entity, relating back to the discussions on opportunism in TCE earlier (2.2.2.2). This risk needs to be carefully weighed up. Entities need to determine whether the penalties that could be suffered if the other party abuses the position of trust are greater than the benefits it gains if the other does not abuse that vulnerability (Nootboom, 2001).

It is beneficial in aiding understanding of trust development between partners to further segment elements of trust into categories. Childe, S. J. (1998); proposes three categories of organisational trust:

- Δ **Goodwill trust** – where a partner is trusted to take decisions without unfairly exploiting the other partner;
- Δ **Contractual trust** – is keeping of promises such as delivering goods or making payments on time, or keeping confidentiality;
- Δ **Competence trust** – depends on the technical and managerial competence of the company to perform a function such as to deliver components within specification

Childe (1998), envisages a progressive evolution of trust in inter-enterprise relationships between all three types as organisations develop their relationships.

As an alternative Whipple and Frankel (2000) cite Gabarro (1987), in defining trust from two different perspectives: character based trust and, similar to Childe (1998), competence based trust. Character based trust encompasses qualitative characteristics of behaviour such as the strategic intent of a company or its inherent culture. Competence based trust encompasses actual operating performance.

There are five sources of character based trust:

- Δ **Integrity:** the partner's level of honesty and principles;
- Δ **Identification of motives:** the partner's true strategic intentions;
- Δ **Consistency of behaviour:** the reliability and predictability of the partner's actions;
- Δ **Openness:** the partner's willingness to be honest about problems;

- △ **Discreteness:** the partner's willingness to maintain confidentiality of strategic plans and key information (Gabarro, 1987)

For competence based trust there are four sources:

- △ **Specific Competence:** specialised operational knowledge and skills;
- △ **Interpersonal Competence:** an individual's ability to effectively perform his or her responsibilities and work well with others;
- △ **Competence in business sense:** a broad experience base beyond a specific area of expertise, and
- △ **Judgement:** decision-making ability (Gabarro, 1987)

A further interesting point is that trust between individuals and the firms they represent do not have to be the same. It is therefore an interesting question to ask whether in dealing with organisations one has to consider both the organisation and the individual "gatekeepers" (Den Hartog, 2003).

Nooteboom (2001), also argued that trust has upper and lower limits of tolerance. Between these boundaries the business of collaboration can be safely pursued without the feeling of excessive vulnerability to opportunism. However, because the threat of failure and exploitation may always be a real one it should not be blind trust or unconditionally given but occur within these limits which can be defined as follows:

- △ **Upper limit:** A test of loyalty at any cost where one may trust someone up to his resistance to temptation or pressure to take up a "golden opportunity".
- △ **Lower limit:** Where one partner may not have the capacity or attention to prevent even the smallest errors or imperfections from arising. That small deceptions and pilferage will not be noticed.

Finally, Zand (1972) noted that, "as partnering companies relax controls, become more accepting of influence, and share information, each company becomes more vulnerable to abuse by the other. If vulnerability is rewarded (i.e. company performs competently and maintains confidentiality) trust is established between the parties". Arguably supply chains are becoming more competitive forcing firms to consider collaboration more. Collaboration is not easy and can lead to a deteriorating

relationship, or if it goes well can quickly build into a more trusting, more inter-dependent virtuous circle. It should also be noted however that it is easier to get into a cycle of mistrust than a cycle of trust. If this is the case it is important to understand a little more about where trust comes from and how it can be managed successfully.

In summary trust is clearly a vital component of any inter-firm relationship. Barratt (2004) states, “a collaborative culture is made up of four elements: trust, mutuality, information exchange and openness and communication”. Trust is an outcome as well as a driver of a collaborative stance and has many dimensions. It can be more easily broken than built - and thus must be looked after carefully by both parties across the Buyer–Seller dyad.

2.3.3.2 Senior Management Support

The presence of senior management support is invariably cited as a critical factor when reviewing initiatives surrounding inter-business ventures. Whipple and Frankel (2000) segment this support into personal encouragement and decision making in the sense of providing resources (e.g. personnel, time, travel, technology, physical plant) and can occur at strategic or operational levels.

Often however, senior management are under pressure to derive some early signs of payback in their own organisation for their investment and thus an ability to demonstrate the business case and show initial progress on payback is invariably seen as important – even an imperative (Horvath, 2001).

To make a partnership possible many authors have argued that there should be a, “mutuality of benefit” between partners. There have to be mutual benefits arising from collaboration (Sparks, 1994) and a sharing of the risks taken (Carlisle and Parker, 1989, Bailey and Farmer, 1990, Ellram, 1990, Crewe and Davenport, 1992, Sparks, 1994). This does not mean that the benefits should be equally shared, but it does lead to the conclusion that each collaborative party should derive some payback for investing in the relationship.

2.3.3.3 Ability to Meet Performance Expectations

The ability to meet performance expectations can be segmented into two distinct issues as outlined by Whipple and Frankel (2000): “Does performance occur as promised?” and “how is performance evaluated?”

On the first question, authors have noted that the state of internal coordination has a bearing on the potential quality of external relationships (Stevens, 1990, Webster, 1992), due to the interfacing of internal relationships with inter-firm relationships. Some have gone as far as stating that many corporate cultures are not capable of supporting collaboration (Ireland and Bruce, 2000, Barratt and Green, 2001), because they are very functionally orientated.

The second area revolves around the setting of clear goals, measuring them and communicating them as a topic area which is fraught with difficulties, as will be examined in the next section. A vital component of a Buyer-Seller measurement system is that it should not be “one-sided”. Conventionally, standards are determined by the Buyer who expects the Seller to perform against set expectations. In a relationship set within a SCM context, this needs to be a two-way process. Both parties have dependencies and are entitled to have expectations of each other. “Evaluating where suppliers and buyers create inefficiencies in the supply chain can highlight problem areas and lead to solutions that improve the relationship and the overall performance” (Whipple and Frankel, 2000).

2.3.3.4 Clear Goals

Performance measures or key performance indicators (KPIs) are used in most facilities today. They help to determine and control commercial performance, ensure achievement of strategic goals and identify problems and can also facilitate the benchmarking of performance against competitors. The objective is to promote better decision making aligned with corporate goals by improving communication channels, visibility of operations and motivating employees behind simple goals.

Traditionally, functionally orientated companies provided incentives for performance in a myopic and self-focussed way. Consequently, it was perhaps not surprising that members tended to focus on their internal performance measuring systems (Stevens,

1990, Lambert & Pohlen, 2001, Peck and Juttner, 2000). The advent of SCM marked a departure from this approach. What was missing were joint goals and common visions (Stevens, 1990, Khan and Mentzer, 1996). Gradually, more holistic measurement systems for the supply chain were developed. These supported the provision of incentives for the wider supply chain system compared to alternative competing systems. Simatupang & Sridharan (2002) support this, adding that the performance measurement system should focus on continual improvement for supply chain members, end customers and outside stakeholders.

A performance measure can be defined simply as a, “measure of the effectiveness of an operation” (Bititci, 2002). Therefore a performance management system is a, “combination of performance measures to control performance” (Bititci, 2002). Fawcett and Clinton (1996) state that effective performance measurement should be characterised by:

- Δ providing the insight for understanding the system;
- Δ influencing the behaviour of the system, and
- Δ providing information regarding the results of the system.

However, defining performance and setting simple goals for the supply chain can be problematic. This stems principally from four reasons.

Firstly, different facilities in the supply chain can have conflicting objectives. In Buyer–Seller relations, sellers who are manufacturers would ideally like long batch runs but the buyer invariably requires flexibility to meet the changing needs and demands of their customers (Simchi-Levi et al, 2003).

Secondly, the range in the type of measures can cause problems. What is required are measures that are quantitative (hard numerical measures) which relatively are easier to compile and qualitative (soft measures), which are more descriptive (e.g. product quality, customer satisfaction ratings, responsiveness). These are harder to source but as has been noted in the discussion of SCM, invariably have a profound impact on the effectiveness of SCM. Measures are also required at operational, tactical and strategic levels and all need to interface with each other if alignment behind the system’s strategic goals is to be achieved.

Thirdly, the measurement system needs to be adaptable enough to be able to cope with the changing supply chain demands. The supply chain is a dynamic system which naturally evolves over time (Simchi-Levi et al, 2003) as customers' demands and supply capabilities change.

Finally, successful performance measurement systems must be forward facing, or focussed on the customer, and ultimately the end customer - not just internally focussed (Carman and Conrad (2000). Intra-company and inter-company measures must be focussed on improving execution to meet customer requirements.

While it may not be possible to satisfy all the criteria, the aim should be to meet as many as possible. However, the system should also be balanced and simple. Possible measures may include:

- Δ Customer service – how well are customers satisfied;
- Δ Productivity – measure of efficiency;
- Δ Asset Management – how well are assets used;
- Δ Quality – effectiveness of an operation;
- Δ Time – responsiveness to customer demand;
- Δ People – employee satisfaction

So what constitutes the ideal measurement system? Caplice and Sheffi (1994), state that it should:

- Δ Link Operations to Corporate Goals (Hierarchical);
- Δ Include quantitative and qualitative measures;
- Δ Encourage improvements rather than "*bashing people over the head*";
- Δ Deliver of value to all stakeholders e.g. customers, shareholders, employees, unions, trade associations, government and society;
- Δ Be able to evolve over time;
- Δ Be widely available – it is important that the measures are communicated across the supply chain and at operational and strategic levels

This is summarized in Figure 19.

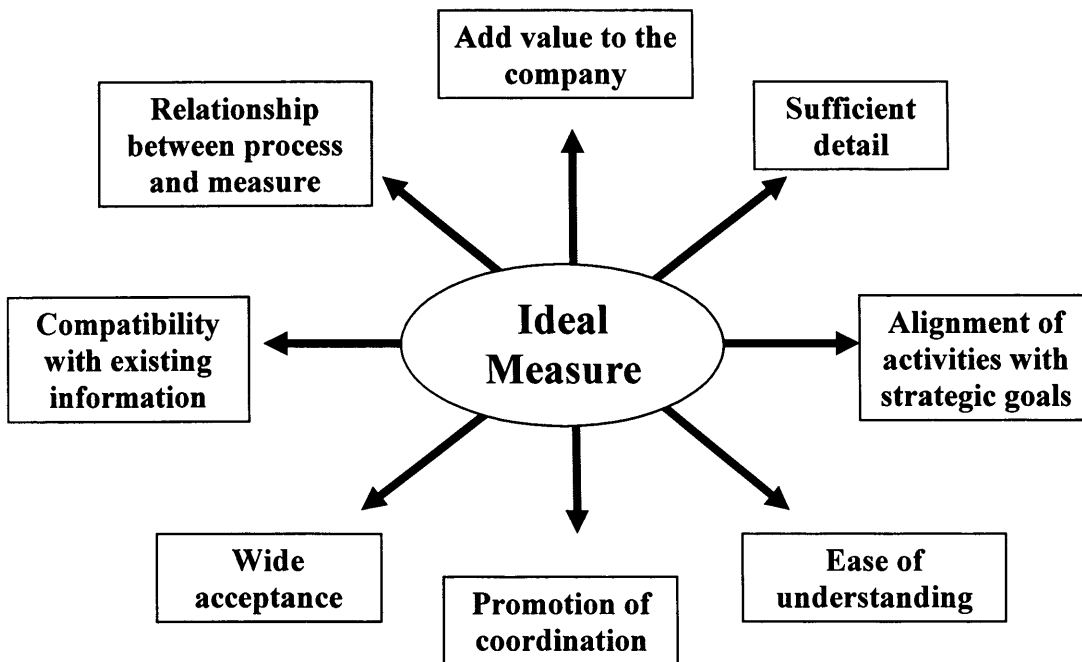


Figure 19: The Ideal Measure: Adapted from Caplice and Sheffi (1994)

In summary, collaborative success between any dyadic inter-relationship (in this case the Buyer and Seller) requires “the establishment and execution of clearly defined goals, and to achieve these goals well defined procedures must be clearly communicated” (Whipple and Frankel, 2000). These procedures might include strong communication systems to disseminate performance, regular joint review meetings, clear attribution of blame if something goes off plan, and methods of assessing that enable both parties to interpret results in the same manner.

2.3.3.5 Partner Compatibility

Harrigan (1988), investigated partner compatibility, researching whether partner asymmetry had a bearing on the success of partnership ventures. This can be defined as, “firms which had complementary missions, resource capabilities, managerial capabilities and other attributes that helped to create a strategic fit in which the bargaining power of the ventures’ sponsors were evenly matched” Harrigan, 1988). She found that partnering ventures lasted longer between partners of similar cultures, asset sizes and venturing experiences, but that partner’s traits did not offer much

explanatory power of relationship success or duration. Indeed, what mattered more was the type of industry (Harrigan, 1988).

Partner compatibility can be defined as, “the ability to plan and work together in a productive, solution orientated manner” (Whipple and Frankel, 2000). Partnering firms need to develop an understanding for each other and learn how to build a spirit of cooperation around a joint-problem solving ability.

2.3.4 Conclusions

This section has explored some of the issues which surround collaboration between the Buyer and the Seller. According to Ellram (1991a) the idea behind SCM is, “to bring together parties beyond the boundary of the firm.... to share the information required to make the channel more efficient and competitive”. Implicit in this argument is that relationships should be built up between Buyers and Customers as has been discussed. The idea under-pinning domains such as SCM and strategic partnerships (within the strategic management field), is to exploit these “relational strategies” in a holistic way (Storey et al, 2006). However, collaboration, although being at the heart of the SCM philosophy, is clearly not a straight forward or exact method. “There is no one size fits all approach to collaboration” (Whipple and Russell, 2007).

Whipple and Frankel (2000) emphasise three points which usefully draw together some of the key learning points in this discussion.

Firstly, they assert that Buyers and Sellers entering into dyadic partnerships should not expect that collaboration will be easy. They also should not expect that there will be an equal exchange of benefits and resources between partners. Each party will bring into collaboration different goals and expectations and consequently a “win” will be defined by both parties differently.

Secondly, they conclude that it is important for the Seller to acknowledge its dependence on the Buyer. It should not be a one way process.

Finally, they argue that even in the better partnerships there is always much room for improvement. Collaboration is a dynamic process (Skjøtt-Larsen et al, 2003) naturally evolving over time and it is important to constantly reappraise goals, communication, performance evaluation and perceptions. Simatupang & Sridharan (2002) endorse this, but also note that all types of collaboration regardless of the type of relationship have a life cycle from the time of engagement to the time of disengagement.

The nature of the Buyer – Seller relationship provides a fundamental foundation to any logistics triad. Next, arguably the second most significant relationship in the logistics triad, the relationship between the Shipper and LSP will be explored and examined.

2.4 Relationship 2: The Seller – LSP Relationship

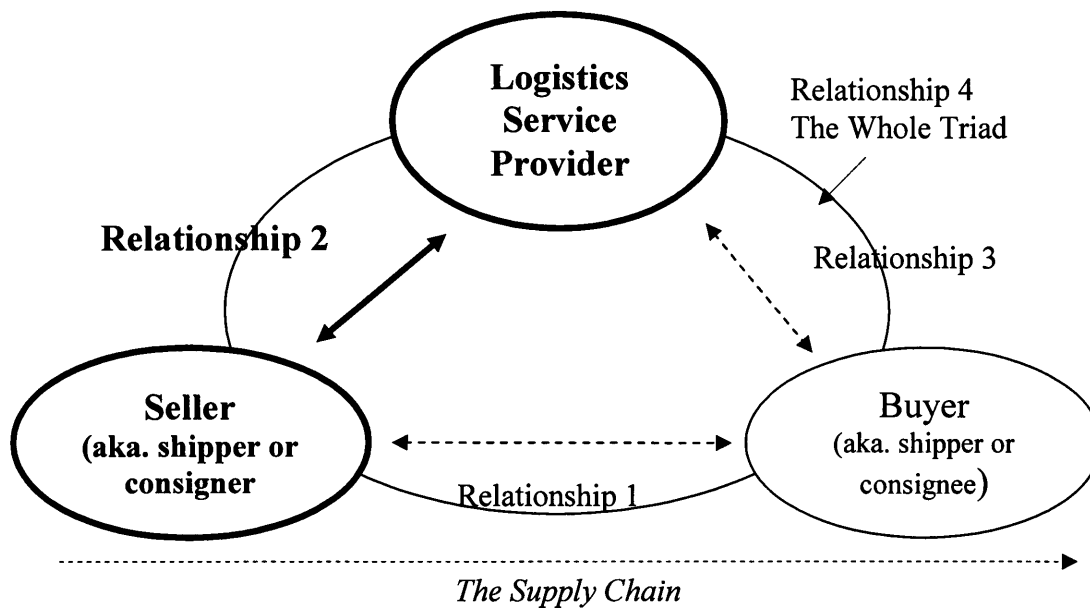


Figure 20: The Logistics Triad: highlighting Relationship 2

2.4.1 Introduction

Relationship 2 occurs when any part of the logistics operation is outsourced to an LSP. This can be defined as, “outsourcing logistics activities including transportation and warehousing to outside firms, which are not a consigner or a consignee” (Simchi-Levi

et al, 2003). This section explores this relationship and the main connected issues focussing especially on the dynamic development of the outsourced logistics industry.

The organisational practice of contracting out part or all logistics activities that were previously in-house has developed considerably in recent years, and is referred to by terms such as “contract logistics”, “third party logistics”, “logistics outsourcing” and “logistics alliances” (Selviaridis and Spring, 2007). It has led to the formation of a sizeable, dynamic and growing industry – termed in this study as the contract logistics industry – which has received increasing attention from academics. In this study these entities have generally been referred to as logistics service providers or LSPs.

According to one of the latest surveys conducted jointly by Cap Gemini, Georgia Institute of Technology, SAP, and DHL, the use of LSPs continues to increase across the world (Latin America, North America, South Africa, Western Europe, and Asia-Pacific). For those five regions the average percentage use of LSPs was between 67% – 84% (Cap Gemini et al, 2006). Lieb and Bentz (2004), who conduct regular surveys of third party logistics in North America, found that 83% of the Fortune 500 companies use 3PL services. Intriguingly, even in the current economic slowdown analysts still predict the logistics industry to show strong resilience as many Shippers look to increase their cost-cutting efforts resulting in increases of logistics outsourcing (Armstrong, 2008)

This section of Chapter 2 focuses on the issues which surround the consequent relationship between the Shipper and the LSP. It begins with a summary of how logistics in business has evolved over the last few decades. Definitions are then set out before the issue of logistics outsourcing and relationship management between the Shipper and the LSP are explored. This includes a discussion on the benefits and risks of logistics outsourcing. Finally the review assesses some of the current key issues in the contract logistics industry which have a bearing on this study.

2.4.2 What is Logistics?

2.4.2.1 The Growth of Business Logistics

Logistics as a subject area has faced considerable change in recent years. Before modern conceptions of what logistics management represents today are presented, it is

useful to briefly set this in context with how the vision of logistics has evolved over the last four decades.

Five distinct eras can be identified from Bowersox's (2007) and Mandrodt's and Davis's (1992) summaries of changes in logistics.

2.4.2.1.1 The Total Cost Concept

In the early 1950's Bowersox (2007) noted that the typical manager of transport, "was expected to continuously lower the cost per hundredweight (CWT) to move products and materials". In 1956 the total cost concept was first proposed by Lewis et al. in their paper, "The Royal Air Freight in Physical Distribution". This article reshaped the argument which moved from optimising costs associated with individual logistics activities such as transport to minimising the total costs of the entire delivery process. The focus of attention therefore moved in the ensuing years from functional focus to an emphasis of minimising delivery costs across the whole firm. Indeed, Bowersox (2007) cited that a break away group, including himself, from the American Marketing Association after discussing the total cost concept formed the National Council of Physical Distribution Management (NCPDM) in December 1963.

2.4.2.1.2 Incorporating the Customer

Beyond the narrower focus of internal processes of the firm, the need to understand that the goal was to deliver products to the end consumer began to drive an extension of the total cost concept to include external as well as internal costs. The management of a channel through which the products were delivered to the end consumer and potentially containing many entities became the common view of what logistics consisted of. Bowersox (2007) added that this change was given great support and credence following a lecture to NCPDM from Drucker (1965) entitled, "Physical Distribution: The Frontier of Modern Management". He defined physical distribution as, "the whole process of business" and stated that many opportunities for considerably improved performance remained untapped.

2.4.2.1.3 The Systems Concept

In the 1970s this evolved further as businesses were forced to react to economic turbulence. The control of costs became even more paramount, "forcing logisticians to

develop dynamic delivery systems that could change in response to changing conditions” (Mandrodt and Davis, 1992). The same authors cited companies such as Quaker Oats and Whirlpool who incorporated capabilities to be flexible in their physical distribution systems combining a number of co-operating organisations towards a common goal – known as, “the systems concept or integrated logistics” (Lambert and Stock, 1993).

2.4.2.1.4 Information for Inventory

New technology development supported this expanded vision of logistics and facilitated the development of further refinement and innovation in the logistics field. The idea of developing capability around information management ensuring accurate and up-to-date stock accounts were maintained allowed for lower levels of inventory in many cases. In 1985 NCPDM replaced the term physical distribution with logistics (Bowersox, 2007) and became the Council of Logistics Management (CLM) in the United States.

2.4.2.1.5 The Customer Service Concept

Throughout the evolving vision of logistics, the importance of incorporating the customer into logistics solutions became increasingly critical. The retention of customers was viewed as vital to better optimising a firm’s on-going profitability potential. Through the 1980’s and 1990’s, as noted earlier in the review of SCM, the importance of customer value rather than a narrower focus on cost minimisation began to develop. The classic trade off of cost versus service was increasingly focussed upon. Mandrodt and Davis (1992) argued that logistics organisations, rather than being limited in service provision to what the company could do, evolved to understanding and providing what the customer wanted. This required a new customer service philosophy to be developed which they termed as “service response logistics”.

2.4.2.1.6 The Collaborative Enterprise

As discussed earlier in this chapter, the emergence of SCM in the late 1980’s and through the 1990’s to today, further extended this thinking of optimising total system performance for the benefit of the end-consumer. Supply chain integration was emphasised as critical to this endeavour (Stevens, 1989 and 1990) and the concept of

supply chain collaboration and alignment emerged and were developed (Bowersox, 2007).

2.4.2.1.7 The Networked Era

In the last decade this evolution of logistics has continued to show great dynamism. Traditional “bricks and mortar” firms have been re-invented along with new non-asset based entities with the goal of leveraging opportunities from the wider industrial network, not just the supply chain network (Mason et al, 2007). Globalisation has continued apace extending the importance of logistics in managing longer and more complex material movement and SCM has become more sophisticated so that logistics practice is seen to be more critical to the fulfilment of the goal of integrated SCM. In reflection of these changes the CLM in the United States officially became the Council of Supply Chain Management Professionals (CSCMP) in 2005. Logistics was positioned as a “supportive process” in the broader field of SCM. The recent unprecedented large increases in fuel prices have also elevated the criticality of logistics strategically as invariably it is an escalating and substantial cost which needs to be closely scrutinised.

In summary, the logistics concept has been highly dynamic and has evolved considerably as demands upon it have changed and as capabilities have grown in terms of mind-set, organisational structures, and organisational cultures supported by considerable developments in technology.

2.4.2.2 Definition and Purpose of Modern Logistics Management

Though there are many definitions of logistics management a common factor concerns the managing of the flow of materials and finished products. Maltz and Ellram (2000), defined logistics as “the *flow* of material, work in progress, and finished inventory”; Smith (2002) advocates that “logistics management is concerned with the organisation, coordination and control of the *flow* of goods through the supply chain”; the Council of Logistics Management (1988) in the United States defined logistics management as “the process of planning, implementing and controlling the efficient, cost-effective *flow and storage* of raw materials, in-process inventory, finished goods, and related information from point-of-origin to point-of-consumption for the purpose of conforming to customer requirements”. More recent

definitions included aspects such as managing the flow of related information in addition to managing the physical product flow. The Council of Supply Chain Management Professionals (CSCMP) in the United States defines it as follows:

*“Logistics management is that part of SCM that plans, implements, and controls the efficient, effective forward and reverse **flow** and storage of goods and services and related information between the point of origin and the point of consumption in order to meet customer requirements”*

(CSCMP – 2006)

It should be noted that this definition also widens the notion of flow management in logistics to include reverse logistics, although this area is not a central theme of this study. They also importantly widen the scope of logistics so that value creation is not solely seen in efficiency terms, but also effectiveness, which is a crucial underpinning concept to the solutions advocated in this research.

The purpose of logistics, as has been discussed above, is to meet customer demands in terms of their value requirements and thus it has a similar goal to SCM. It would therefore appear that they are both important supporters of each other (Ellram, 1991a). This will be discussed in the next section when the strategic significance of logistics management is underlined.

2.4.2.2 Strategic Significance of Logistics Management

The macro-environment faced by modern industry (Chapter One) and the notion of SCM, with the move to more integrated supply chains (Chapter Two – above), have highlighted the external environment that invariably the Shipper – LSP relationship is embedded within (Marasco, 2008). The providers of logistics services, in the sense that they are not only responsible for the physical transportation of products through the supply chain (*the material flow*), but much of the related data management (the information flow) and associated finances (the cash flow) can play a vital role in supply chains and the fulfilment of SCM strategies. As the link provider between the product Seller and Buyer they can be seen as integral cogs in the chain and thus can be in a position to act as crucial supporters and even facilitators of modern SCM (Skjøtt-Larsen, 2000, Mason and Lalwani, 2004 and Naim et al, 2006).

Today, in many sectors, the importance of goods arriving consistently on time to the right place (time and place utility) is invariably paramount. If delivery is inconsistent then this either results in sell outs, or the uncertainty leads to a decision to stock higher levels of inventory as a buffer. Higher levels of inventory damages competitiveness as they eat up capital and can result in higher damage, obsolescence and theft costs; the antipathy of the SCM approach.

Moreover, consistent delivery on time is vital not only to the reliable operation of the supply chain system but also to the reputation of all participating service and supplying firms. In the modern context of what is demanded from supplying organisations, LSPs need to ensure that they are able to be trusted to consistently and reliably fulfil their obligations if inter-dependence between the Buyer and the Seller and the Shipper and the LSP is to be maintained and built upon.

So basic logistics provision of delivering on time in full every time is of strategic as well as operational importance in supporting strategies to build and sustain competitive advantages based on process excellence.

Indeed, the value that logistics provision is able to provide can be harder to imitate than the core product itself (Christopher, 1992). Logistics can therefore be considered as a key component of a company's competitive strategy. This will be more fully reflected upon when a range of the theories which are argued as underpinning logistics management and SCM are set out at the end of this chapter. However, it is also worth briefly commenting on it here.

Christopher (1992) sets out the argument behind this stance explaining that, "organisations which only compete on product's features will find themselves at a severe disadvantage to those companies that augment the basic product with added value services". He refers to Theodore Levitt (1983) who infamously stated, "people don't buy products they buy benefits". Logistics provision has the capability to offer critical components of the total value offer which augment the core product (Figure 21).

The outer “halo” indicates that as well as the core product, the service attributes, to which logistics provision is a core contributor, form part of the value proposition. Factors such as delivery reliability, ease of doing business, the ability to operate to short lead times, order and product tracking visibility strengths and the ability to accommodate fluctuating and perhaps unpredictable demand can all be key value capabilities in determining whether a customer chooses one supplier over another in both business to business and business to customer scenarios.

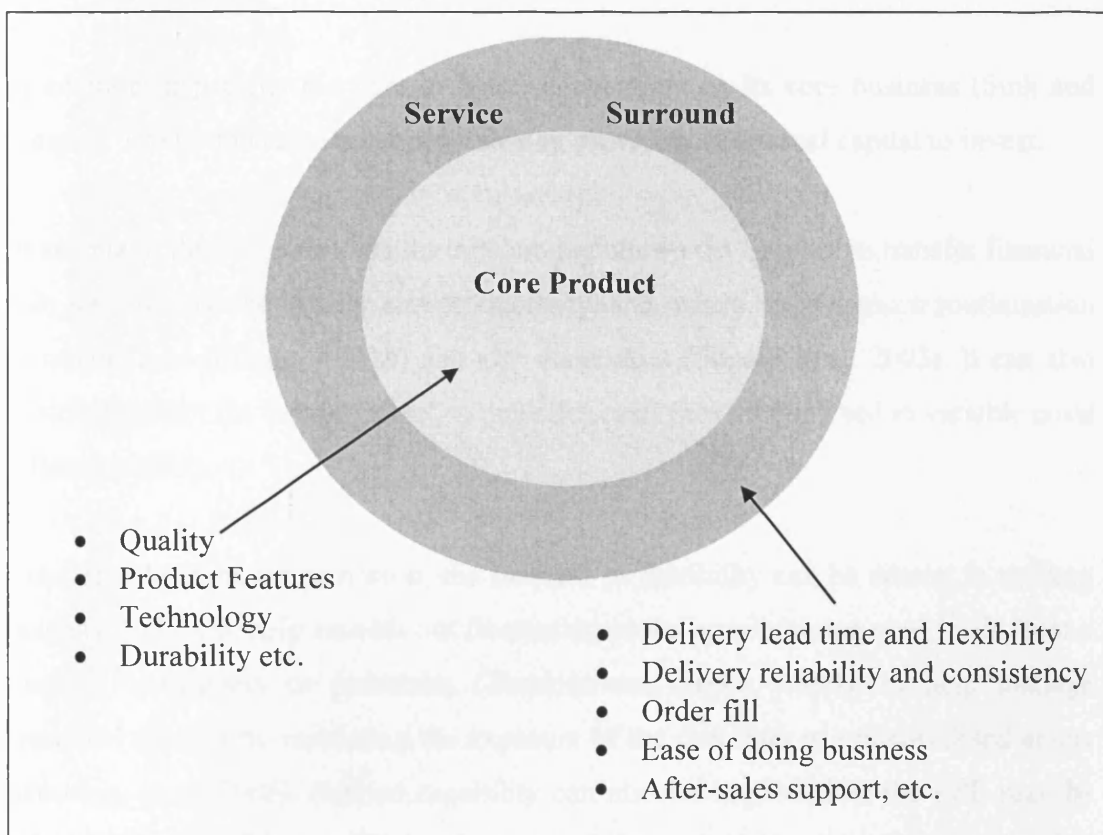


Figure 21: Using Logistics Service to Augment the Core Product (Christopher, 1992 developed from Levitt, 1983)

2.4.3 Logistics Service Provision

2.4.3.1 In-House or Outsource?

In logistics provision, as has been noted, the trend over recent decades has been to pursue an outsourcing strategy in many marketplaces and this has produced a growing logistics industry in many sectors (Transport Intelligence, 2004). There are many potential benefits for the Shipper for pursuing an outsourcing strategy. These include:

- △ cost reductions;
- △ capital reductions;
- △ availability to production capacity and competence;
- △ releasing internal resources, both personnel and equipment;
- △ sharing risks with partners;
- △ quicker time to market;
- △ better strategic flexibility and so on (Griffiths, 2001, Embleton and Wright, 1998, Ellram , 1991b, Simchi et al, 2003)

In addition, it permits the firm to better concentrate on its core business (Sink and Langley, 1997), and can also support this by providing additional capital to invest.

In summary, the move to logistics outsourcing allows the Shipper to transfer financial risk, improve service quality and productivity, and reduce costs through routinisation of transactions (Ellram, 1991b) and size economies (Simchi et al, 2003). It can also positively affect the balance sheet, as logistics costs move from fixed to variable costs (Hannon, 2007).

Compared to in-house provision, the increase in flexibility can be crucial in modern markets. LSPs can help smooth out fluctuating peaks by combining workloads from a range of customers or industries (Tomkins and Smith, 1998), or help manage workload troughs by restricting the exposure of the customer to under-utilised assets (Rushton, et al, 2006). Service capability can also be improved as the LSP may be able to create multi-user distribution centres located closer to customers making feasible more frequent deliveries, with tighter lead times (Tomkins and Smith, (1998).

The attractiveness of these benefits have led to the development of a growing and dynamic new industry sector, the contract logistics industry, principally since the 1980's in most parts of the world (Rushton et, al. 2006).

2.4.3.2 The Growth of the LSP Industry

What are the driving forces behind this growth? Sheffi (1990), identified three underlying factors which explained the early growth that launched the sector. These were economic, regulatory and technological reasons.

2.4.3.2.1 Economic Factors

From an economic perspective contributory factors combined. Many traditional logistics providers focussing on a specific logistic function were finding it hard to differentiate their competitive offering in what was a largely commoditised industry and consequently margins were thin. By offering extra logistics services it was hoped that extra value would be provided for the customer and their position would become more entrenched. In addition, the trend towards core competency focus was resulting in many companies emerging who were keen to divest of logistics activities.

2.4.3.2.2 Regulatory Factors

The regulatory position was clearly different in various parts of the world, but as a broad trend the sector was becoming gradually deregulated, liberalising competition and permitting a more open marketplace for logistics services. In the area of focus for this study – the UK within the setting of the European Union, 1993 was a critical date as this marked the start of the de-regulation of intra-Union transport. This has meant that it has been much easier to move goods between member countries of the EU and has been a major contributory factor which has led to the market for transport and logistics services changing since the early 1990's.

Skjøtt-Larsen et al (2007) note that Shippers have moved to planning and managing production and distribution systems on a pan-European rather than on a regional or national basis. This centralisation of logistics activity with one or a very limited number of production and distribution sites serving the whole of Europe has led to “an increased demand for, “direct, fast frequent, and reliable shipments to customers” (Skjøtt-Larsen et al, 2007).

Deregulation and liberalisation of the logistics markets has also led to many types of players from many different origins coming together in competition. This has served to intensify the nature of competition and has continued the pressure on margins. One of the topics at the main logistics conference in Europe each year, again highlighted at the EyeForTransport Logistics Providers Conference in Brussels in November 2007, was how could the industry fight back against the constant erosion of margins?

2.4.3.2.3 Technological Factors

On a technological basis, the changes that have resulted from adopted developments in information communication technology (ICT) have had a profound effect, both directly impacting on the logistics operating model, and indirectly on all aspects of the larger business environment that operators work within.

The result has been that firms have continued to outsource not only traditional logistics activities such as transport or warehousing, but also related managerial activities and even in some cases production as well. At the same time LSPs have continued to expand their own portfolios of capabilities to provide broader service offerings and increasingly more customised solutions to specific customer segments (Fabbe-Costes et al, 2008).

2.4.4 Managing the Shipper - Logistics Service Provider Relations

2.4.4.1 The Relationship Spectrum

Clearly, if the decision is taken to outsource, the question that flows from this is how should the carrier be managed? Similar to the debate covered in the Buyer – Seller relationship (Relationship 1), should an arms length transactional model be adopted or should a more Network orientated strategy (Jarillo, 1988) be developed, where stronger relationships are built up with the LSP?

However, Fawcett and Mangan (2002) highlight an important point in this regard which is pertinent for the study's research on the Logistics Triad. They suggest that a "distinction is made between materials suppliers and service providers (such as logistics providers) because these two types of suppliers are typically managed differently, often by different functional areas within the organisation.....that is materials suppliers are managed by purchasing while service providers such as distributors and transport providers are managed by logistics, marketing, and at times purchasing". They go on to suggest that to "provide superior augmented products, companies must manage both types of suppliers in a coordinated, seamless manner" (Fawcett and Mangan 2002). These points are very insightful and will be incorporated into the research study.

Further comprehension of the logistics relationship between the Shipper and the LSP has emerged as a critical issue in understanding how the industry has developed.

Many authors have looked to categorise and explain the potential spectrum of relationships between a shipper and the LSP. An early attempt at this came from Bowersox (1990), who argued that there was a link between the degree of integration between the Shipper and the LSP and the degree of commitment. At the traditional more transactional, market based end of the spectrum he noted that in logistics one type of outsourcing is characterised by single transactions. This would require only a very basic level of inter-relationship between the Shipper and the LSP. The degree of commitment and integration would increase up the spectrum from this very traditional and basic level, moving from single transactions to repeated transactions where some kind of very limited inter-relationship existed, to partnership agreement, third party agreements and finally integrated service agreements where inter-relationships are very extensive, supported by a high level of cooperation and mutual obligations (Figure 22). This was endorsed by LaLonde and Cooper (1989) in their survey of LSPs. They defined a logistics partnership as, “a relationship between two entities that entails the sharing of benefits and burdens over some time agreed horizon” (LaLonde and Cooper, 1989).

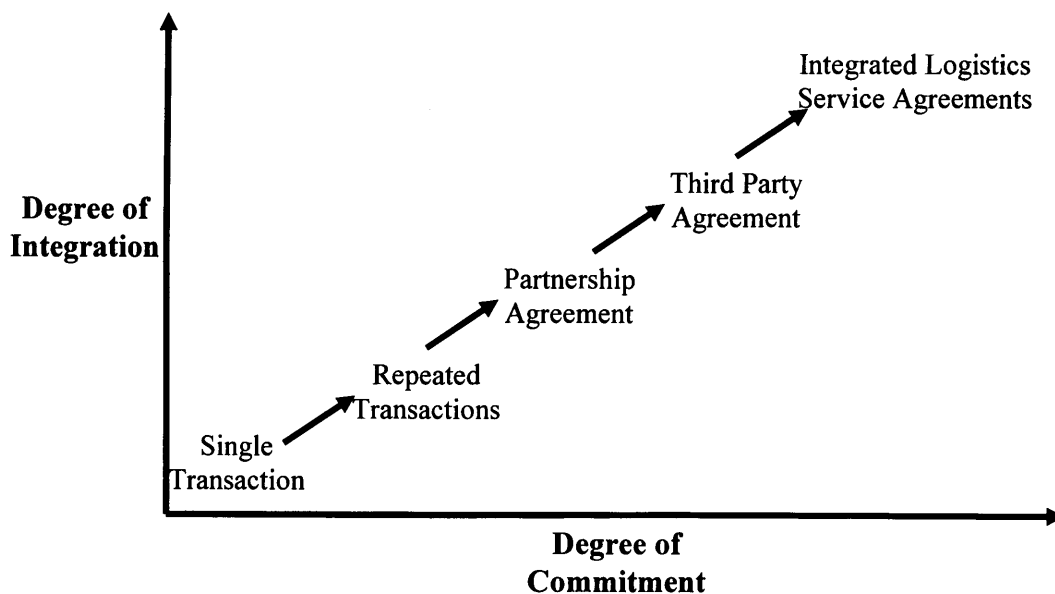


Figure 22: Shipper-LSP Relationship Spectrum (adapted from Bowersox, 1990)

Another example of the categorisation of the Shipper – LSP relationship which followed similar lines was developed by Lambert and Stock (1993). In total, six specific types of relationships were identified: Arm’s Length, Type I Partnership, Type II Partnership, Type III Partnership, Joint Ventures, and Alliance (Table 3).

The first category on the spectrum is the Arm’s Length relationship. In transport provision, if the decision is taken to outsource, there is an attractiveness in pursuing a pure *Market* model based on a purely transactional basis. Many practitioners and academics still argue that transport of freight is very much a commodity operation. If this is so, it makes it very hard for logistics operators to differentiate their offerings from competitors. Cost is a critical part of the value equation (see Johansson et al, 1993, Figure 11), particularly accentuated in outsourced activities (Domberger, 1998) and hence it could be concluded that total value could be best optimised by taking a full *Market* based approach. This equates to appointing the LSP purely on a transactional basis (the lowest bidder winning the contract) and managing the consequent relationship on an “arms length”, potentially adversarial, footing. Price is maintained as the dominant criteria for the next category, but with the difference that this time a Type I relationship would be identified by the addition of a short-term contract to support this.

Types	Contract Length	Investment	Activity Scope	Service Offered
Arm’s Length	None	None	Very Small	Very Basic
Type I Partnership	Short	Low	Limited	Basic
Type II Partnership	Longer	Moderate	Moderate	Various
Type III Partnership	No Formal End Point	High	Substantial	Complex
Joint Venture	N/A	Very High	Large	Complex
Alliance	N/A	Very High	Large	Complex

Table 3: Classification of Shipper-LSP Relationships (Lambert and Stock, 1993)

Type II Partnership is also contractual, but compared to Type I the contract is longer term and the scope of activities is invariably wider. Research has shown that there is not necessarily a link between the length that companies have worked together and the degree of inter-dependence and partnership that has been developed. This category therefore is used to describe situations where an LSP has been re-appointed over successive contract periods but no effort to “partner” has been undertaken by either party. There may be fewer suppliers, longer term contracts and possibly some attempt to mutually understand and work around each other’s pertinent business issues, but there are no information linkages or jointly held performance indicators.

Type III is not governed by a typical contract mechanism as such, and the scope of activities frequently includes a sharing of responsibilities between the LSP and their client. It is a much looser, more trusting partnership than Type II.

Alliances are positioned beyond this and again exhibit very high investment, large scope of logistics activities and often complex service requirements based on the understanding that the collaboration will result in mutual benefits for both parties. Here a discernible degree of inter-dependency is introduced between a Shipper and an LSP. This category in its most advanced state can also be known as a *Strategic Alliance*. Ellram (1990) defines these relationships as a strategic partnership;

“a mutual, ongoing relationship involving a commitment over an extended time period, and a sharing of information and the risks and rewards of the relationship”.

Ellram, 1990

An alternative longer definition is given by Bagchi and Virum (1996) who define a logistics alliance as follows:

“a logistics alliance indicates a close and long-tem relationship between a customer and a provider encompassing the delivery of a wide array of logistics needs. In a logistics alliance, the parties ideally consider each other as partners. They collaborate in understanding and defining the customer’s logistics needs.

Both partners participate in designing and developing logistics solutions and measuring performance. The goal of a relationship is to develop a win-win arrangement”.

Bagchi and Virum (1996)

Beyond inter-firm governance and collaboration is Joint Venture. This involves the creation of a new firm requiring investment from both parties which dictates an even longer term arrangement. Finally, vertical integration may occur when logistics provision is performed as in-house activity.

2.4.4.2 The Evolution of Shipper – LSP Relationships

A number of academics have reported that there has been a discernible shift in certain sectors towards more partnering based relations between Shippers and LSP in recent years (Lu, 2003). To understand why, it is important to explore some of the underlying factors that are contributing to the needs to adopt this more collaborative behaviour. The evolving needs for a more contemporary definition of third party logistics symbolises this change.

One of the early definitions of third party logistics provided earlier from Lieb et al (1993), - “any form of externalisation of logistics activities previously performed in-house”, - was clearly all embracing (perhaps deliberately), and intended to encompass a range of outsourcing services from inventory management to distribution (Coyle et al, 2003). As pointed out in the discussion above, this definition is now out of date in light of how the logistics industry has evolved.

Authors such as Skjøtt-Larsen et al. (2007) note that LSPs now have “a more strategic scope: to increase market coverage, improve the level of service and/or increase flexibility to meet the changing requirements of customers”. This is insightful on two levels. Firstly, it helps to explain how the evolution in how third party logistics has been perceived and defined and, secondly, it begins to partly explain how relationships between Shippers and LSPs have developed. As will be explored, although managing such relationships is not easy, it is more likely today that a more collaborative culture is developed than would have been the case in the early 1990’s.

Conventionally, if out-sourced, a transactional market based approach was how outsourced transport and logistics provision was managed. Moreover, some envisaged that the advent of the electronic marketplace would have added further support to this model, by ensuring the marketplace was better supplied with potential providers, moving it further towards the economic model of perfect competition and thus tightening the pressure on costs. Today, trading platforms such as “Freight Traders” are used but the electronic marketplace for freight transport provision has not come to dominate the logistics market in quite the way that was envisaged by some and feared by many providers. Still a transactional, more adversarial platform for managing logistics and transport provision is still relatively common.

However, there are problems with pursuing this kind of *Market* based approaches with costs as the principal value criterion. This has been particularly noticeable in supply chains where more advanced and more integrated supply chain strategies have become established – for example in the grocery, aviation, automobile and electronic sectors. Thompson and Sanders (1998) point out that “a supply chain will only be as strong as the weakest link” and this can be in the logistics process if the relationship between the Shipper and the LSP is not managed carefully (Spekman et al, (1998).

In addition, as Skjøtt-Larsen (2000) confirms, there has been a change in many Shipper-LSP value perspectives as a more supply chain orientated perspective has developed. Value requirements have evolved so that whilst competitive cost containment is still actively sought, it is not the sole, nor arguably always the dominant value criteria. He cites other demanded aspects of a more strategic nature, including increasing market coverage, improving the level of service or increasing flexibility capability towards changing customer requirements. In short, in inter-dependent supply chains where inventories are run more tightly and lead times are compressed down, the service reliability of freight transport provision becomes a balancing trade off with cost containment in the value equation.

Thus, in logistics provision during the 1990’s until today, a more *Network* based model for logistics management has begun to emerge as an alternative to a purer Market based model, as elements of the value equation other than just cost have become more valued (Skjøtt-Larsen, 2000). So the importance of developing alliances



or strategic alliances with trading partners in pursuit of the SCM ideal of an integrated supply chain have become incorporated within the logistics field (LaLonde and Cooper, 1989, Whipple et al, 1996, Bask, 2001) in addition to other more established alliance groups such as between Buyers and Sellers. Clearly many of these new logistics models place a high premium on collaborative initiatives.

“To minimise total costs and maximise customer value, transportation integration is essential within the supply chain”. (Morash and Clinton, 1997)

Skjøtt-Larsen (2000) notes, that this definition underlines the importance of having a strategic element under-pinning the Shipper – LSP partnership, an important point that has a clear implication for the management also of the logistics triad in an integrated supply chain.

He also argues that a number of elements have to be fulfilled before a provider can be termed as a third party logistics provider (3PL). This links the discussion back to the debate surrounding the definition of third party logistics introduced at the outset of this section. As third party logistics has developed, it is perhaps no surprise that the way it is defined has also had to change. From Lieb et al's (1993) very broad definition, third-party logistics has been delineated by many authors from this basic outsourcing of logistics activities. Murphy and Poist (2000) now define third party logistics as,

“a relationship between a shipper and a third party which compared with basic services, has more customised offerings, encompasses a broader number of service functions and is characterised by a longer term, mutually beneficial relationship”.

Murphy and Poist (2000)

This concurs with Bagchi and Virum (1998) who define it as, “a long-term formal or informal relationship between a Shipper and an LSP to render all or a considerable number of logistics activities for the Shipper”. This partnering under-pinning of the relationship can then be seen as a distinguishing issue in separating basic logistics outsourcing from outsourcing to third party logistics in the contract logistics industry.

A combined categorisation of dyadic relationships in logistics covering many of the principal points gleaned from Bowersox's (1990), and Lambert and Stock's (1993) research typologies and incorporating the separation of basic contract logistics from third party logistics with a partnering or collaborative relationship, is given in Figure 23.

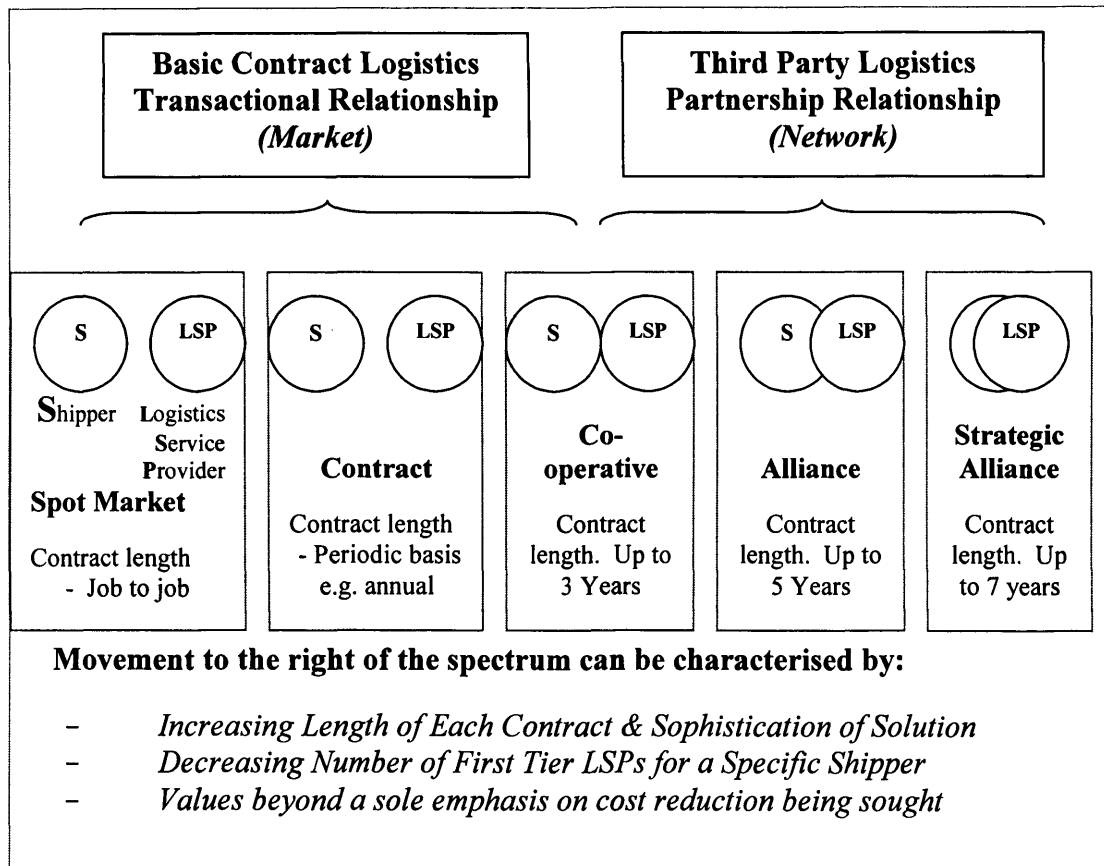


Figure 23: The Shipper-LSP Relationship Spectrum indicating where Basic Contract Logistics is separated from Third Party Logistics

A further distinguishing feature that Leahy et al. (1995) and Skjøtt-Larsen et al (2007) cite as important is the presence of management in the third party logistics providers' role. Berglund et al, (1999) define third party logistics as "activities carried out by a logistics service provider on behalf of a shipper and consisting of at least management and execution of transportation and warehousing (if warehousing is part of the process)". Management can clearly vary from basic planning and cost management to very sophisticated leadership concerning the SCM strategy and execution. However, the definition again helps to delineate between basic outsourcing of logistics where

the emphasis is solely on the execution of the service, to third party logistics where execution and management responsibilities are outsourced.

Finally, a further important method of categorising types of LSP needs to be understood as this potentially has an important bearing in terms of relationship level. In essence LSPs can be split on the basis of whether they are asset owners or non-asset owners (Sheffi, 1990). This has been further refined by Berglund et al's (1999) typology of the different types of provider which is split into three categories:

- Δ Asset based logistics providers;
- Δ Network based logistics provides;
- Δ Skill based logistics providers

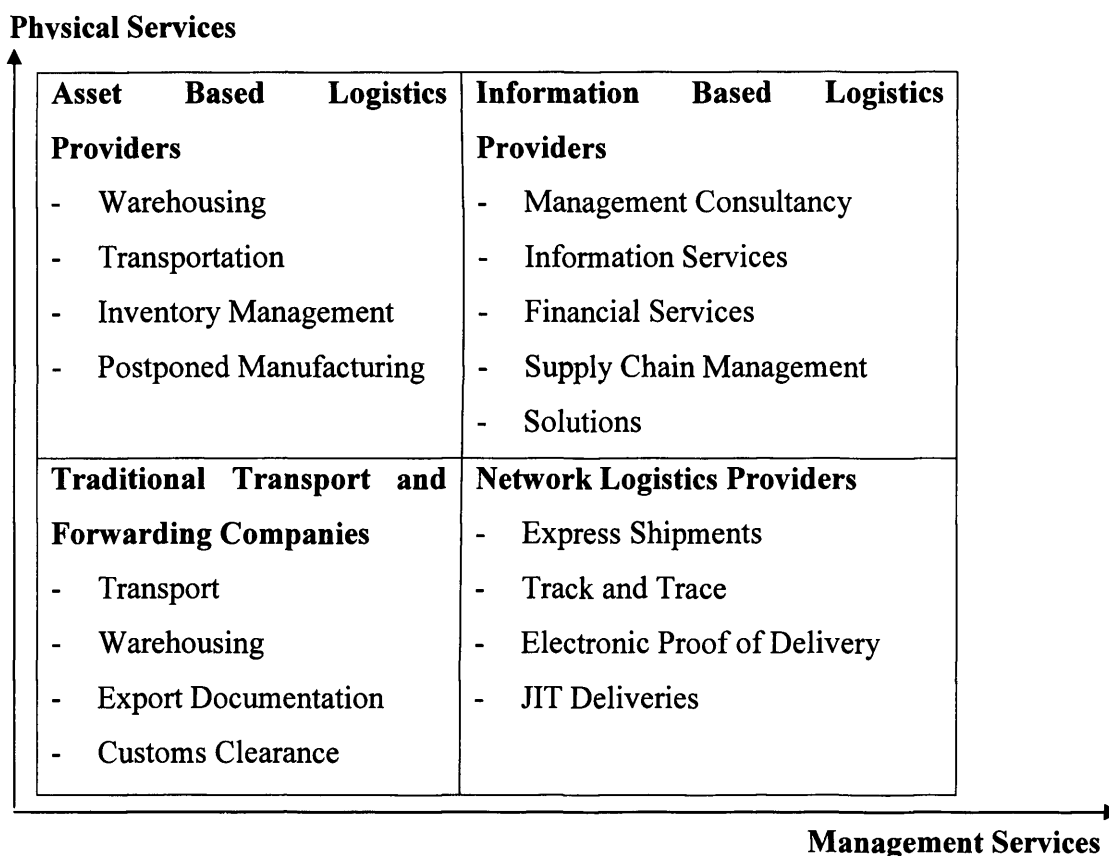


Figure 24: Typology of Logistics Services (Originally developed by Berglund et al, 1999)

Asset based logistics providers were typical of the early players that were seen from the late 1970's and early 1980's. Owning logistics assets such as trucks, containers, or warehouses they extended their core business to offer wider logistics services.

Network based logistics providers emerged from the 1990's. Invariably originating as express parcel or courier services these companies developed a global capability so that door to door shipments could be delivered with more reliability and more quickly than traditional means. The ability to track deliveries and provide proof of delivery further differentiated their capabilities and supported their aim to add value for the customer.

Skill based logistics provision developed in the late 1990's. These logistics providers typically moved away from owning assets, but instead offered consultancy, or coordinating and information management services. They also became lead logistics providers, taking on accountability for a logistics contract whilst not undertaking any physical logistics activities themselves. Instead, they in turn outsourced operations to sub-contracted logistics players. Berglund et al (1999) combined the asset/non asset typology with the degree of management categorisation to summarise various types of LSPs (Figure 24).

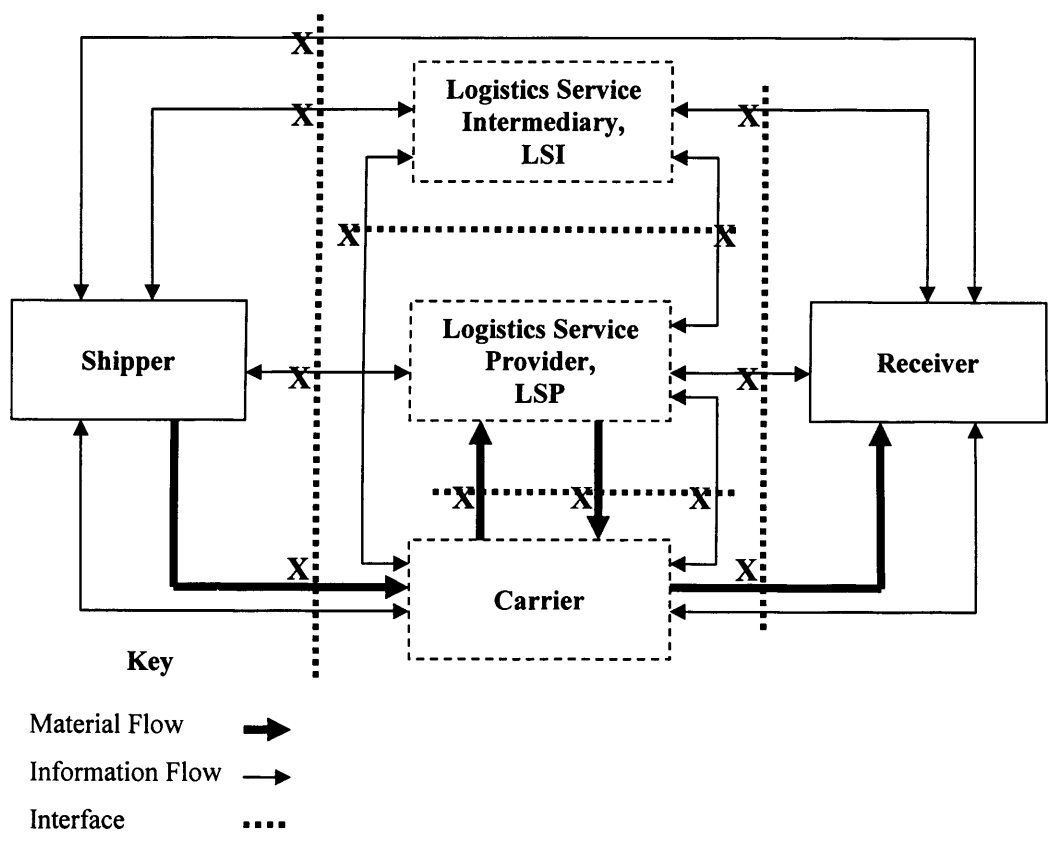


Figure 25: Three Stage Collaborative Logistics Management Model (Stefansson, 2004)

This segmentation of alternative logistic provision models has been further explored by Stefansson (2004 and 2006). He reflects that a more complex structure is often exhibited in logistics service provision. As well as the basic Carriers, LSPs together with what he terms Logistics Service Intermediaries (essentially non-asset based players) need to be considered as part of the logistics services entity (Figure 25). Each element, he argues, has different roles to play and services to provide and each has potentially different links to the other two members of the triad in terms of material and information flow.

This is an interesting model as essentially it represents an adaptation to the logistics triad model indicating the interface of logistics provision with the Buyer and the Seller but also incorporating any sub-contract hauliers (carriers) who might be deployed, and any participating overseeing logistics player, as well as the core LSP which is focussed upon in this study's logistics triad model.

In terms of relationship between the LSP and the Shipper, Sheffi (1990), argues that there exists a potential conflict between asset owning LSPs and the Shippers. Asset owning LSPs focus on best utilising their assets – a potentially contradictory position to the goals of the Shipper (Sheffi, 1990). Non asset based providers or Logistics Service Intermediaries (according to Stefansson, 2004) with no transport based assets, on the other hand, are freer to forge closer relationships with the Shipper.

In summary, Relationship 2 exhibits many of the same typology spectrums identified in Relationship 1 between the Buyer and the Seller: a spectrum from a pure transactional links - the so called arms length category – through to a more strategically orientated, trusting and mutually beneficial category of an alliance or collaborative basis. However, if a more modern definition of an LSP is taken, the spectrum is narrower as it is assumed that a form or partnership is inherent in the relationship with a third party logistics provider.

Finally, an additional point is made by Halldorsson and Skjøtt-Larsen (2006) who claim that the Shipper – LSP relationship emerges over time and is not pre-defined in many cases. The partnership develops as competence is proven and trust grows.

Shippers often adopt an “increasing scope” strategy in respect of their relationship with logistics suppliers. According to this theory, the level of partnership is drawn quite tightly in the initial phase when Shippers are looking for specific solutions in order to assess the capabilities of the LSP. Over time the level of relationship and the range and criticality of tasks expands to include more value-added and customised solutions (Sink and Langley, 1997).

2.4.5 The Risks of Logistics Outsourcing

The principal benefits of outsourcing logistics were introduced in the introduction of this section to explain the emergence and growth of the third party logistics industry. To provide a fuller understanding of the issues involved in outsourcing logistics and the challenging management of the subsequent inter-relationship, these benefits are now contrasted against some of the principal risks involved from the perspectives of both the Shippers and the LSPs. This is an area where there has been less research as the principal focus has been on generating a better understanding of the benefits from both the LSPs’ and the Shippers’ perspectives of developing closer relationships. This point is underlined by Lambert et al (1999) who state that, “whilst the advantages of outsourcing logistics provision has been promoted there has been less on the pitfalls and dangers”.

One of the early studies in this area (Lieb and Randall, 1996) identifies three principal areas of potential difficulty for the Shipper concerned with developing closer relations with an LSP. The first two concerns are that the Shipper may fear a loss of direct control over logistics activities and connected to this the Shipper may experience heightened uncertainties about the service level (Ellram and Cooper, 1990, Makukha and Gray, 2004). In modern more integrated supply chains, serving more demanding customers, the ability to ensure total quality in the area of service has become a critical constituent of many firms’ value propositions. Logistics provision represents a significant proportion of this service package in many instances. In some situations the delivery of the product is the one occasion where there is a physical interface with the customer. Therefore, to entrust this activity to an outside agency can be considered to be a serious risk.

The third concern Lieb and Randall (1996) highlight is that Shippers may be concerned over questions concerning the true cost of outsourcing. This is an interesting point as many decision makers may fail to take full account of all the costs involved in switching an activity to an outsourcing position, which can be very high (Rushton, et al. 2006), as can monitoring costs. Gibson et al, (2002) highlight in a survey of Shippers predominantly in North America that while cost remained the most important attribute in LSP outsourcing, Shippers were in reality much less satisfied that LSPs actually provided low costs services when it came to appointment and evaluation.

An over-arching concern which is inherent in many Shipper-LSP relations is a breakdown of trust. In order to retain control, Shippers may measure performance very tightly, which can lead to feelings of resentment and a distrusting atmosphere (Coyle et al, 2003). This lack of trust can also manifest itself in a reluctance to share information (Jung, et al, 2007).

A further, alternative method of identifying the principal risks of outsourcing and generating closer links with the LSP is to analyse the causes of failure in an outsourcing logistics arrangement. Ellram (1995) identifies the following issues as causes of failure.

- Δ poor communications;
- Δ lack of managerial support;
- Δ lack of trust;
- Δ lack of supplier TQM;
- Δ lack of strategic direction;
- Δ lack of shared goals and
- Δ poorly organised transition.

This provides a valuable insight into many of the core practical issues involved in setting up and maintaining an enduring relationship in this area. A further study in this area was carried out by Ackerman (1996). He endorses many of Ellram's (1995) findings in identifying lack of understanding as a central issue. He also adds that over-promising and under delivery by the LSP is problematic and even deliberate sabotage

from Shipper personnel (presumably wishing for the contract to be returned as an in-house operation) can be evident.

This evidence underlines the point that forming and maintaining successful dyadic relations is fraught with difficulties and problems and is dynamic and complex. It also highlights a major hurdle for tripartite relations inherent in the logistics triad. If successful dyadic relations are so problematic and risky how can effective tripartite relations necessary in a successful logistics triad be managed?

2.4.6 Aligning Relations Strategy with Logistics Strategy

One of the key issues that academics highlight as being important to glean the most from an inter-organisational relationship is to ensure relations strategy is aligned with the over-arching corporate strategy. Stemming from this emerges a central question that academics and practitioners have asked, – “what level of inter-relationship is appropriate to pursue for the Shipper - LSP”?

There have been many studies which have tried to establish reasons why closer relations are pursued between a Shipper and an LSP. Halldorsson and Skjøtt-Larsen (2004) argue that they observe a degree of correlation between the level of integration in the Shipper-LSP interface and the degree of specific investments in the relationship – in other words the level of asset specificity. This is developed from Cox’s (1996) typology of supply chain relationships and links back to the discussions presented earlier in the chapter on TCE theory. Indeed, in Figure 26 the plotted levels of governance go beyond even the strategic alliance and suggest that where there is a great deal of asset specificity and a high degree of integration, a joint venture or even an in-house solution may be the outcome.

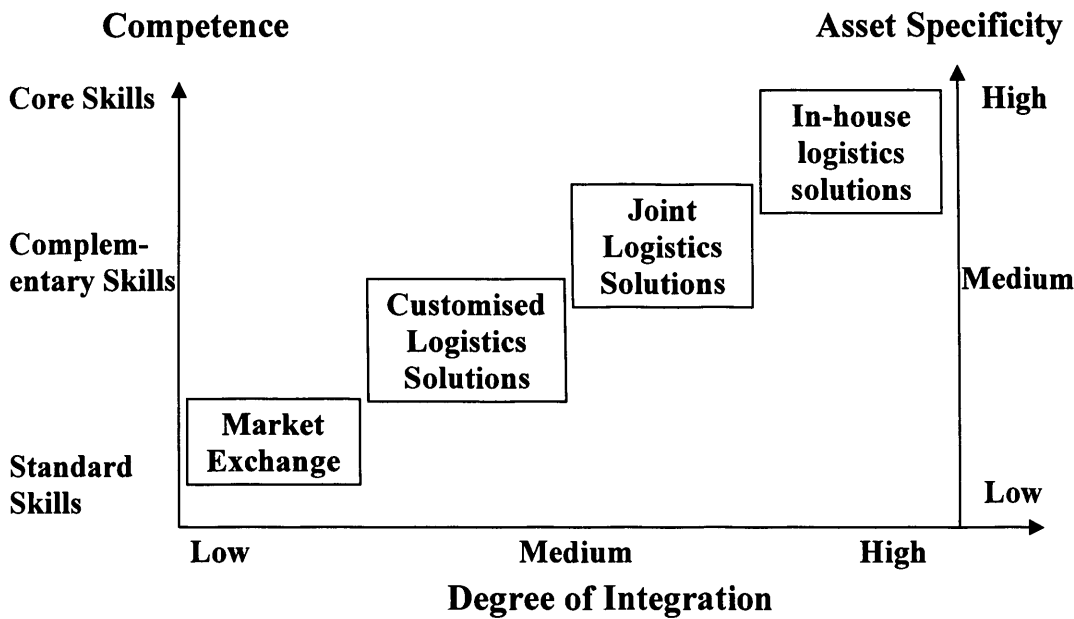


Figure 26: Understanding Forms of Logistics Organisation and Governance (Halldorsson and Skjøtt-Larsen, 2004)

The Service Process Analysis matrix has been developed from a concept originally developed by Tinnila and Vepsalainen (1995) to help explain when strategies and relationships are aligned by Bask (2001) and Bask et al (2008). Service types range from routine operations to highly customised offerings, while the relationship spectrum again ranges from transactional through collaboration to hierarchy levels. The service processes and relationship level demark the most efficient combination of service level and relationship level Bask (2001) argues (Figure 27). “LSPs can be seen as supportive members for supply and value chainsthis implies that LSPs should strongly support company strategies” (Bask et al, 2008).

Bask (2001) uses this matrix to address the question of appropriate relationship level by developing an argument initiated by Lambert et al (1999). She suggests that there is invariably a mis-match between the level of service provision and the level of customer relationship in logistics. Generally – most relationships are “moderate” while the complexity of logistics services range from simple to complex, which she argues leads to problems of inefficiency. She concludes that the most efficient match of relationship and service types should be deployed – that is, close relationships should occur where service levels are complex; standard relationships where service

complexity is medium and loose relationships where service levels are simple. Bask (2001) concludes that the “one size fits all” approach to LSPs needs to be replaced with “clearly packaged” different types of LSPs with distinctly segmented service types and aligned relationship strategies. This business model highlights the importance of, “separating, classifying and prioritising processes that have the greatest impact on supply chain performance” (Bask et al, 2008), so that logistics provision is aligned with the contingent supply chain strategy.

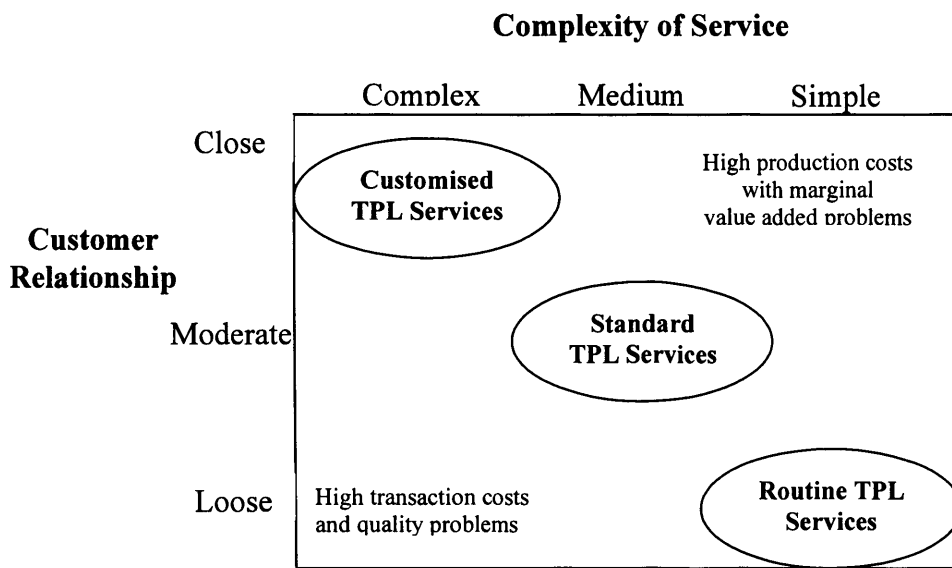


Figure 27: Relationship among LSPs and Members of Supply Chains (Bask, 2001)

Fundamentally, the relationship between the Shipper and an LSP is built around the performance of the LSP which as a *service* provider is relatively intangible (Lu, 2003). Gentry (1996) supports this, suggesting that, “critical elements of successful collaborative arrangements are sustained service performance by the LSP on behalf of the Carrier”. But beyond this, to change from a short-term opportunistic stance to a longer term partnering position, both parties, “must have a vision of a partnering relationship and the objective of developing such a relationship for it to work” (LaLonde and Cooper, 1989). In logistics relationships, to move from a day to day operational view to a longer term perspective requires an extension of the partnering base so that it is founded on multiple contacts across the organisation.

Barratt (2004) supports this, noting that this range of relationships between two parties can be categorised into strategic, collaborative and cultural elements. Based on

this framework the alignment of partnering goals at a strategic level and supply chain metrics at a collaborative level can be seen as key elements of this approach. The principal goal of partnership is for both companies that have engaged in a collaborative activity to improve their operations individually but also as the holistic supply chain (Fawcett and Clinton, 1996). Therefore, the adopted performance measures need to combine to support this endeavour.

2.4.6.1 Measurement Alignment

The conclusion that emerges is that participating organisations' cultures, ethos, ways of working and thinking as well as their capabilities to provide reliable performance delivery must all be aligned and supported by a tailored measurement system.

Zsidisin (2007) theorises that from an operational sense there are three critical measures in managing LSPs in integrated supply chains:

- Δ **On time delivery performance** – percentage of deliveries which arrive at or before the delivery time;
- Δ **Declined freight** - % of loads accepted/not accepted;
- Δ **Dropped trailers** - % of trailers dropped at start of day

To support these types of hard output measures four critical softer and more tactical measurement categories stand out as needing to be adopted by leading edge LSPs.

The LSP/Shipper relationship needs:

- Δ **predictability,**
- Δ **velocity,**
- Δ **reliability**

and

- Δ **reactivity**

Each is defined in Table 4 and discussed below.

Term	Definition/Aim
Predictability	<i>“The degree of forecast accuracy”</i> The Author, 2009
Velocity	<i>“Improved inventory turns per year, or tightening the number of days of inventory on hand”</i> Morash and Clinton, 1997
Reliability	<i>“Reduced variability of shipment times around the mean transit time”</i> (Morash and Clinton, 1997)
Reactivity	<i>“The ease of accommodating special requests”</i> Daugherty et al, (1992)

Table 4: Definitions for Four Critical Measures in Logistics Management

2.4.6.1.1 Predictability

Predictability can be defined as the degree of forecast accuracy. Forecasts are always, at best, an approximation of the future and therefore are often inevitably wrong. Given that they drive so much decision making in the supply chain they are quite rightly cited as a significant problem area in any attempt to better optimise supply chain performance. For LSPs the unpredictability and volatility of demand on their assets cause, both in the short term and the longer term, major problems in planning and executing their business models and ensuring assets are efficiently used by right-sizing them to demand levels. This is an issue which is explored more fully in Chapter Four where real examples of the impact on LSPs operations are shown in both the steel and grocery sectors.

Various strategies have been suggested and deployed to attempt to militate against this issue. For example, there has been a discernible shift towards pull based rather than push based supply systems. A pull based system suggests that supply chain activity only occurs when there is sufficient demand to trigger production and/or distribution. This is possible for the supply of certain goods and services in certain situations when the time it takes to produce and distribute a product is less than the time the customer is prepared to wait (Hoekstra and Romme, 1992). However, although the need for forecasting is reduced and some system induced variability

stemming from the bullwhip effects in the supply chain are removed, demand signals can still be unpredictable and volatile as end-customer demand changes. The second method, and an area which underpins much of the study, is to develop closer, more collaborative relations with supply chain partners to share information and to work together to better understand and prevent demand unpredictability and fluctuation. Finally, the third method to improve predictability is to compress the time period which the forecast has to cover - thus reducing the chance of inaccurate predictions. This can be achieved through revising the supply chain design, which is largely beyond the boundaries of this study and/or by speeding up the supply process – indeed the quest for velocity as a source of potential competitive advantage will be covered in the next section.

2.4.6.1.2 Velocity

Velocity refers to, “the number of inventory turns per year, or the average number of days cover of inventory on hand” (Morash and Clinton, 1997). As far back as 1988, Stalk (1988) claimed that time was the “next source of competitive advantage”. Citing Japanese companies, such as Toyota, Mitsubishi and Honda, Stalk (1988) identified that shortening the planning loop in the product development cycle and trimming process time” in short, “managing time the way most companies manage costs, quality or inventory” was an important “strategic weapon”. It had spin off benefits not just impacting on cost reduction but also enabling a wider product range, faster incorporation of improved specifications, and broader market coverage. Being capable of rapidly responding also had the impact of improving predictability as shorter forecast periods were required, resulting in lower costs and happier customers.

The implications for logistics of this heightened emphasis on time based strategies are considerable. Faster transit times support process based strategies which aim to reduce inventory stocks held in reserve. Linked to this is reduced transport “dwell time” (Morash and Clinton, 1997), which again can aid responsiveness. Time based strategies also mean that smaller batches are required to be handled more frequently. For transport, where vehicle fill rates are important in terms of profitability, as well as from an environmental perspective, this is a significant issue.

2.4.6.1.3 Reliability

In Leahy et al's (1995) survey of LSPs, which surveyed their perceptions of the most important determinants of successful logistical relationships, the capability of the LSP to be dependable came out as the second (behind customer orientation) most important factor. Leahy et al (1995) defined dependable as the provision of services in a "consistent and reliable manner". In the more time-focussed supply chain strategies (Stalk 1988), discussed above, rapid delivery is not enough. What is required is dependable or reliable delivery. Such a capability is vital in allowing supply chain primary players to reduce "just in case" inventories.

It also follows that the LSP needs to be responsive and to develop the capability to be able to react to the needs of the customer.

2.4.6.1.4 Reactivity

Leahy et al's (1995) third capability, identified in the same survey, was termed "change orientation", which they defined as, "the ability of the provider to easily adapt to a changing business environment and develop contingencies to minimise system breakdowns" (Leahy et al, 1995). This is akin to what can be termed "reactivity".

Again in supply chains which are more time focussed, if there is a delay in any supply chain process the LSP "may be called upon to speed up its performance so that cycle times remain constant and robust" (Morash and Clinton, 1997). Indeed, Daugherty et al. (1992) identified that customer responsiveness (reactivity), which they termed as, "the ease of accommodating special requests", was an attribute which defined the potential performance of the leading LSPs. Mandrodt, and Davis (1992) emphasised this point stating that customer retention was, "a function of the firm's ability to meet the needs of the customer consistently.... no longer can a company just focus all its attention on the product or service it offers to the marketplacerather the focus must be on the requests of individual customers and customising the products or services to meet their individual needs". Having the capability to react to unforeseen or unpredictable requirements can be a key differentiating factor in determining who wins out in logistics contract allocation battles.

2.4.7 Conclusions

In summary, it is clear that what is meant by the term logistics has changed considerably in recent years. In addition, competitive pressures, either from within the supply chain or externally from competitors, have helped to ensure that logistics organisations and their customers are leaner and more flexible, and this in turn has further pushed the development of the contract logistics industry. Through experience and specialisation, effects the LSP may be able to offer cost efficiencies through better handling of the routine logistics operations such as cash flow, distribution planning, regulatory adherence, and safety issues and/or service benefits through improved capabilities to respond more tightly to customer needs and improved flexibility capability compared to an in-house alternative.

However, the demands are tough, the industry is highly competitive and it takes a great deal of motivation, skill, and commitment to make logistics happen efficiently and effectively over the medium and longer terms. Invariably, what are required are a united service orientation and a two way collaboration and communication between the Shipper and the LSP to support the Buyer/Seller relationship.

The LSP also has an inter-relationship with the third party in the triad, the Consignee and this is the subject of the next section.

2.5 Relationship 3: The LSP – Consignee Relationship

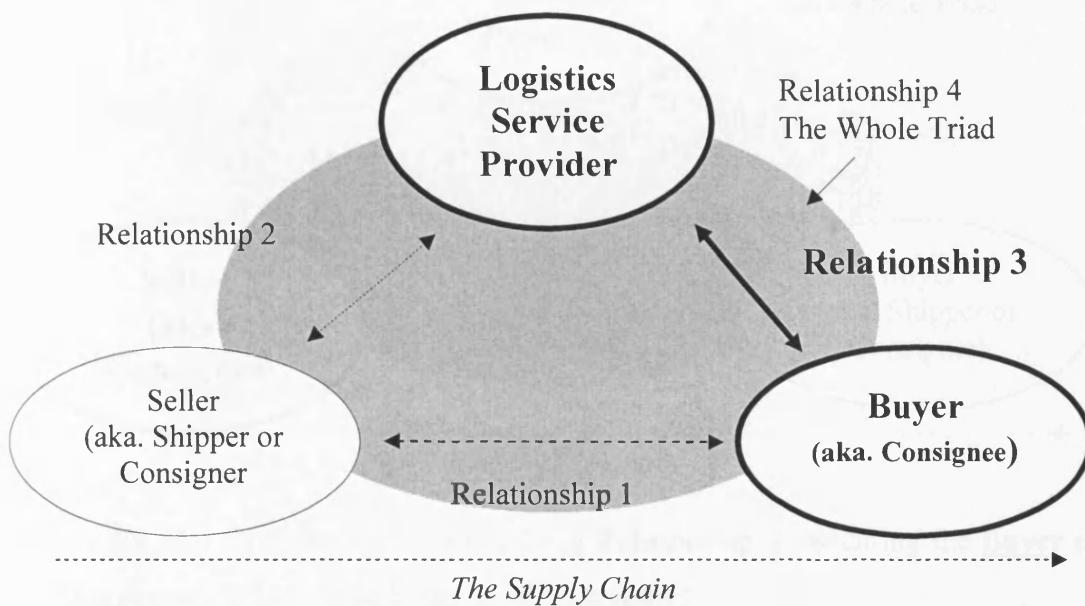


Figure 28: The Logistics Triad highlighting Relationship 3 (assuming the **Seller** is the **Shipper** and therefore the Buyer is the Consignee)

2.5.1 Introduction

This section will focus on Relationship 3, the interface between the LSP and the Consignee. This relationship is a very different interface than the inter-relationship between the LSP and the Shipper, although there are some parallels. First, a brief discussion on the positioning of this relationship within the logistics triad is covered.

In the Methodology Chapter four assumptions surrounding the structure and governance of the logistics triad in this study set out. The fourth assumption states that in this study, “the seller of the product is responsible for organising outsourced logistics provision”. Clearly, whether the Seller or the Buyer is the Consignee depends upon which party is responsible for outsourcing the logistics provision. If it is the Seller, then the Buyer is the consignee (Figure 28); conversely, if it is the Buyer, which can occur, then the Seller is the Consignee (Figure 29). In the discussion below it is for the most part presumed that the former set up is adopted; i.e. the Seller is the Shipper and the Buyer is the Consignee.

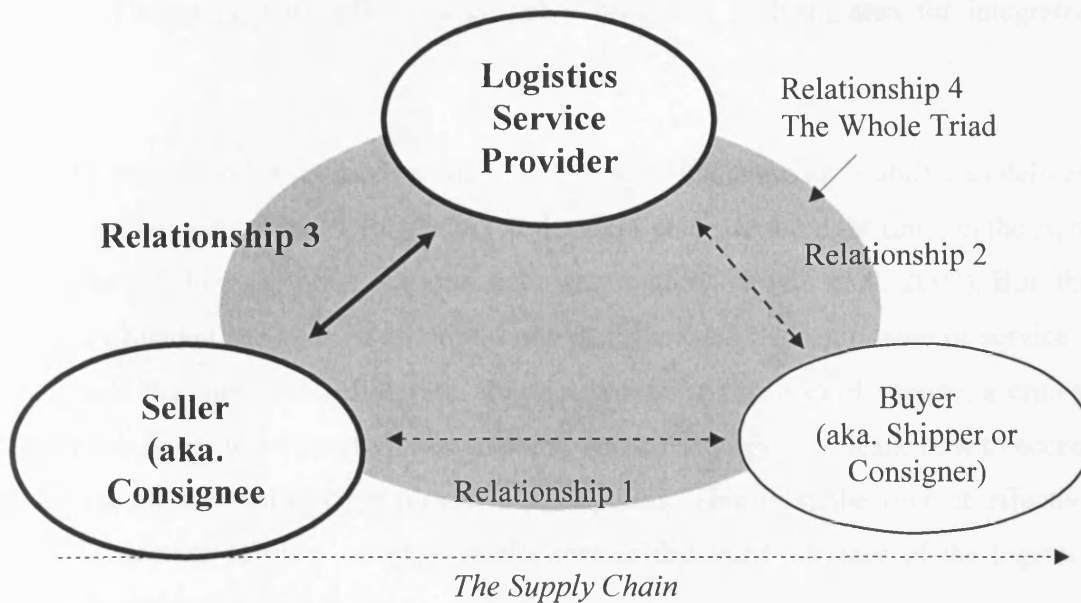


Figure 29: The Logistics Triad highlighting Relationship 3 (assuming the **Buyer** is the **Shipper** and therefore the Seller is the Consignee)

The review of this relationship will be structured as follows. Initially, the focus will be on identifying the unique attributes of this relationship, which are in contrast to the other two dyadic relationships. Secondly, the importance of sensing the perception of the customer will be underlined followed by an exploration of the potential role of the LSP in gleaning this knowledge. Finally, the challenges and opportunities inherent in this relationship are set out and examined.

2.5.2 The Unique Attributes of Relationship 3

For the two logistics triad relationships explored so far in this Literature Review, the discussion has centred on relationships which are commercial in that they involve a direct exchange of a product or service for a financial return. The third relationship, the relationship between the LSP and the Consignee, implicitly does not contain this under-pinning element. Indeed, although there is clearly an interface, there is invariably no formal contract in place and therefore the exchange or inter-relationship is much harder to assess. Nevertheless, as has been noted, it is argued by many academics that SCM requires close inter-relationships to exist throughout the chain of

supply. Does this potentially weaker link represent a problem area for integrated SCM?

For the Seller, part of its product market offering is the company's ability to deliver, "the right amount, of the right product at the right place, at the right time, in the right condition, at the right price with the right information" (Coyle et al, 2003). But, the service provided needs to be tailored – not all firms need the same level of service – they need the *right* level of service. To ascertain the right level of service, a critical factor that needs to be incorporated into any service strategy is to learn how to access and evaluate the Shipper's customer's perceptions. This is at the root of effective logistics service delivery which is at the core of this third interface of the logistics triad - Relationship 3.

2.5.3 The Shipper's Customer's Perspective

"Customer value is the currency of commerce" (Kotler, 1999). The ability to have a customer orientation is therefore a critical attribute. Kotler (1999) states, "customer value is important as customers are value maximisers.....customers will buy from the supplier that offers the highest value".

Logistics service provision is part of the supplier's value package and in many logistics surveys a customer orientation is found to be a vital capability. For example in Leahy et al's (1995) survey of LSPs, a customer orientation was cited as the most important factor in determining the success of logistical relationships from the LSPs' perspectives.

What should be clarified in the logistics triad however in taking a "customer orientation" is who specifically the customer of the LSP actually is: the Consigner of the outsourced logistics activity (the Shipper), the product receiver in the logistics triad (the Buyer), or another entity beyond the triad itself (the "ultimate" customer)?

This is an important issue to pin down as it is clear that there can be confusion surrounding the identity of the LSPs actual customer. Leahy et al (1995) identify the customer as the Buyer in the logistics triad and define a customer orientation as – "a

philosophy that customer service is a process that results in value added to the service exchanged.....this includes the provider's ability to customise or tailor its services to the buyers needs"....in short possessing the capability to be, "responsive to customer's (the buyer's) needs" (Leahy et al, 1995). However, it is implied in the discussion that Leahy et al (1995) present that the Buyer is not the Buyer as defined in the logistics triad in this study, but as the Buyer of the logistics service – i.e. the Shipper. This is a fascinating assumption which highlights a fundamental concern associated with outsourced logistics provision when the Buyer is the Shipper. Who is the LSP's customer?

Hagan (1994) correctly picks up this point. He claims that, "it is logical to think that the logistics company's strategic relationships are with the customers with whom it directly contracts but there is very little scope in modern logistics to make significant inroads into the competition on the grounds of price or servicethe answer is to look not at the relationship between the logistics company and its customer, but how that relationship is viewed by the customer and its customer". Hagan (1994) goes onto suggest that as the logistics company should add value to the supply of goods from the producer to the customer, "if somehow it can add extra value, the logistics company will be much more competitive in the eyes of the primary relationship". As has been discussed above, there are many dimensions of customer service which logistical competence is able to add to the core product in terms of providing a total value package for the customer, which can from now on in this study be assumed is the Buyer of the product.

However, one important dimension has so far only fleetingly been mentioned: the perception of the customer. As Tucker (1980) states, "the key to customer service is understanding the customer and their perceptions...it does not matter what a supplier (or an LSP on behalf of the supplier) does, but rather what the customers think the supplier does in the area of customer service" which is important. Often the LSP, through their service delivery link to the supplier's customer, represents the only physical contact with the customer. This could provide vital information in any attempt to sense the perception of the customer who, as Piercy (1997) emphasises, can be hard to understand: "customer preferences are irrational, mis-informed, mis-guided

and short-sightednevertheless, knowing what value means to our customers is rather important”.

An equation which usefully sets out the dimensions which need to be understood in terms of customer perception is Jobber (2001). He states that perceived customer satisfaction is derived from their perceived benefits set against their perceived sacrifices. Customers estimate the value and costs and hence the overall capacity to meet their needs. Benefits can be more than the provision of the core product as has been previously noted: service aspects provided by the LSP such as dependable on time delivery (reliability) or the capability to accommodate a last minute urgent order (reactivity) can be crucial differentiators in one supplier competing successfully against another. Similarly, perceived sacrifices can be more than just cost. Time, energy and psychic costs all can play a part in decision-making surrounding supplier selection. Moreover, this equation will always be dynamic – the elements within it will change over time. Customers expectations are continuously increasing: today’s order winning capability will become tomorrow’s expected criteria (Hill, 1985).

Marketing academics point out that the strategic rationale behind the aim to consistently meet or exceed customers’ expectations is the loyalty factor and the notion that customer retention is a powerful driver of on-going successful commercial performance. Christopher (1992) notes that many companies’ profitability performance can be explained by their ability to retain customers. Butz and Goodstein (1996) argue that if an emotional bond can be developed between a Buyer and a Seller this can lead to the customer buying repeatedly or even exclusively with that supplier.

So logistics customer service is very important: “it represents the interface between the Buyer and the Seller where all the effort of logistics is geared towards” (Christopher, 1992). However, the Seller needs to be able to listen to or sense the Buyer’s perceived benefits and/or sacrifices, they need to understand them, and they need to translate this knowledge into renewed action. The LSP, as the physical interface in terms of product delivery can play a potentially vital part through their relationship with the Buyer, not only in providing service excellence, but also in ascertaining where the pains are on behalf of the Seller. This can be at a quite sophisticated level. As Maltz and Maltz (1998) state, “shippers need to go beyond the

basics and understand what the customer wants besides availability, timeliness and reliability”.

In short, carrier service quality can be seen as potentially a critical capability to a wide variety of Shippers in volatile markets who require stronger primary supply chain linkages. “Transport and logistics is being seen as an integral part of the company’s marketing efforts as a distributor not just as a functional transporter running a discrete operation” (Wagner and Frankel, 2000), and beyond this developing the capability to interface with the Consignee to provide valuable insight into how further improvements in the Seller’s competitive offering can be achieved.

2.5.4 The Challenges Inherent in Relationship 3

However, for these opportunities to be realised a range of challenges need to be overcome. One of the keys when reviewing changes in Relationship 3 centres upon the question, on whose instigation do improvements in this relationship occur?

Gentry (1996), finds in her research of logistics triads that this can come from any of the three triad members. For example, she cites a triad in the bicycle sector where the Buyer (a retailer) was dissatisfied with the performance of the supplier’s chosen carrier in not meeting delivery schedules with undamaged bikes on a regular basis. In this case the Buyer and the Seller worked together with the LSP to rectify the problems. However, in most cases the LSP was contracted by either the Buyer or the Seller (usually the latter) who also had sole responsibility for LSP relations. As the provider of the service the LSP is invariably responding to the needs of their immediate customer – invariably the Seller and this contributes to explaining why there are few examples of pro-activity on behalf of the LSP in improving the LSP – consignee relationships.

Hagan (1994) summarises the problem: “knowledge is vital but information is useless unless it can be used to an advantage.....information that can be turned to advantage is knowledge”. The key is to understand “how logistics can tap into this knowledge ... the logistics function must be proactive in both the decision cycle to trade and in the supply of knowledge to the other companies” (ibid).

Being proactive in a partnering context is perhaps expected of the LSP, but being proactive where no formal partnering structure exists between the LSP and the Consignee is more challenging. Gentry (1996) finds that the LSP is more likely to be involved in joint problem solving and decision making where strong Buyer-Seller partnerships exist, than instigating and carrying through their own initiatives. More often she notes that the Carrier or LSP are not involved in the development of new systems, which may affect them, including in one case where a new Just in Time system was launched.

Morash and Clinton (1997) argue that there should be regular meetings planned in between the LSP and the Consignee. This gives the LSP a platform from which enhanced transport flexibility, improved supply chain integration, and total cost reduction can be managed from.

2.5.5 Conclusions

This review of the final dyadic relationship in the logistics triad has exposed that a potential weak link in the chain of supply can occur, when an activity such as logistics provision is outsourced, between the LSP and the Consignee. Whilst a considerable literature has been developed on the two principal relationships in the logistics triad there has been comparatively little on this third dyadic relationship which is still fairly embryonic in terms of academic development and is an identifiable gap for this research study to begin to fill.

The final relationship within the logistics triad, the tripartite relationship between all three constituent players is now the focus of the next section in the literature review.

2.6 Relationship 4: The Whole Logistics Triad

2.6.1 Introduction

In reviewing the research of logistics service provision within the domain of SCM it is evident throughout this Literature Review that relationship studies have focussed

predominantly on the nature of dyadic relationship, principally in terms of the Buyer and Seller and the LSP and the Shipper. In fact, as has been noted and discussed, LSPs typically have not just a contractual link with one party (the Shipper or Consigner), but also a service link to the third party (the Consignee). Indeed, Bask (2001) argues that the notion that the LSP provides a logistics link between the two principal entities in the chain of supply, the Buyer and Seller, explains where the name “third” party logistics comes from. The LSP is the third party in the triad.

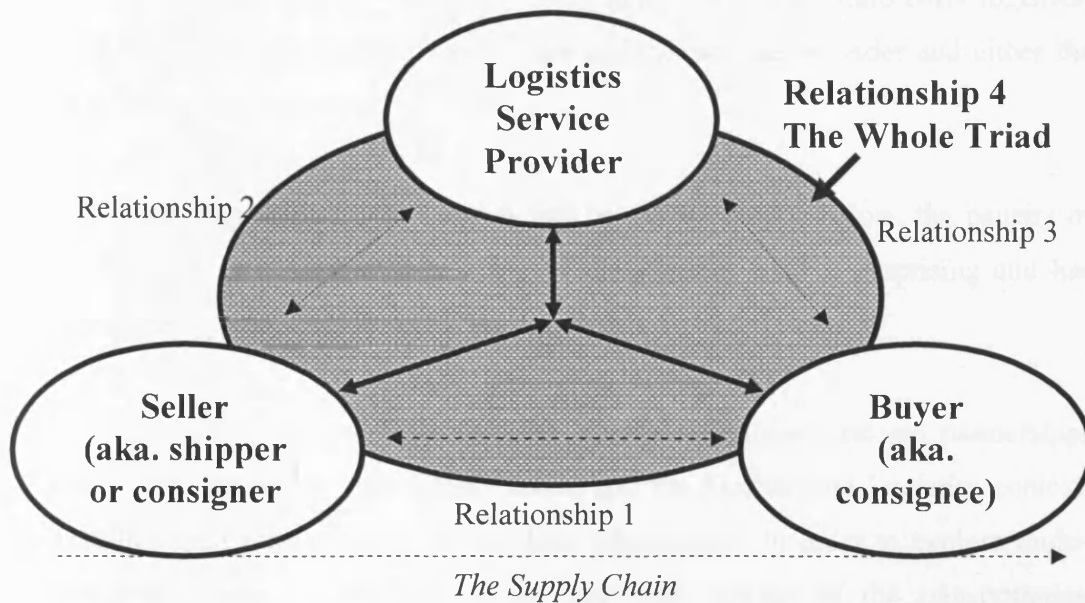


Figure 30: The Logistics Triad highlighting Relationship 4 the Tripartite Relationship

This section examines the whole idea of the logistics triad and explores the issues involved in understanding tripartite relations - the three way management of relations between all three members of the triad. It is structured as follows: First, the paucity of research in this area is underlined with reference to the few authors who have contributed to this field of research. Next, a summary of the evolution of thinking and principal research findings in the subject area is set out, focussing on the studies which have been published which assimilates what has been learnt. Following this, some of the issues raised are brought together and commented upon.

2.6.2 The Paucity of Research Activity on the Logistics Triad

Bask (2001) states that, “a triadic relationship was (is) the most satisfactory starting point for matching logistics service/services to seller/buyer relationships in supply chains”. However, as highlighted at the outset of this section, the predominance of research on the two way partnership in logistics service provision has meant that tripartite logistics has by comparison been largely under represented in research terms. This finding is endorsed even this year in a major literature review of third party logistics by Marasco (2008), who states that, “most research (in third party logistics) addresses the two way linkage between the logistics service provider and either the buyer or seller (of the goods)”.

Despite a few important studies, which will be reflected upon below, the paucity of research activity surrounding the notion of the logistics triad is surprising and has been consistently commented upon. For instance:

- Δ Gentry (1996) states, “although the literature explores strategic partnerships within both the Buyer and Seller context and the Shipper and Logistics context, there has been little attempt to link these relationships in order to explore multi-firm interactions to address the three-way linkage of the transportation provider between suppliers and purchasing firms engaged in these partnership agreements”;
- Δ Larson and Gammelgaard (2001) observe that, “virtually no research addresses the three way linkage of the transportation provider between supplier and purchasing firms”, and
- Δ Stefansson (2006) concludes that, “we, along with other authors, have identified only a few related subsequent studies” (in the topic of the logistics triad).

This lack of research is further endorsed by Selviaridis and Spring (2007) in their literature review of third party logistics. They provide a taxonomy for third party logistics research by classifying refereed journal papers published within the period 1990 – 2005. They use Harland’s (1996) levels of analysis to condense categorisation into three categories; the firm, the dyad, and the network (any level of complexity above the dyad such as the triad, or horizontal networks such as the 4PL). They

identify that it is at the network level where the biggest shortfall in research is apparent. In summary only 6% of papers exist at this network level (Table 5).

Level of Analysis	Percentage of Studies	Indicative Topics
The Firm	67	Outsourcing Decision, Selection Criteria, 3PL growth
The Dyad	27	3PL Success Factors, Contracting, Performance Measurement.
The Network	6	Logistics Triads , Horizontal Networks

Table 5: Analytical Level of 3PL Research (Selviaridis and Spring, 2007)

Finally, to confirm this finding a full document search of the scholarly literature was carried out. Two alternative key search phrases, “logistic* triad” or “tripartite + logistic*” were entered into two of the most prominent database search engines in business related research, ABI/Inform Global and Business Search Premier, for any citation or abstract. The ABI/Inform Global identified only four publications relating to these fields (Beier, 1989, Larson, 1992, Larson and Gammelgaard, 2001 and Rodrigues et al, 2008), and the Business Search Premier identified only two, both also in the ABI listing. When “All Text” was searched on Business Source Premier, two further publications were found both by Larson (1994 and 1998).

Bask (2001) notes that the principal cause for the research focus on the dyadic relationship is due to the fact that logistics contracts are usually managed between the Seller and the Carrier or the Buyer and the Carrier, but not both. However, the “logistics triad” has not been completely ignored and the most notable contributions are set out below.

2.6.3 The Evolution of Research Activity on the Logistics Triad

The term “*logistics triad*” was first coined by Beier (1989). He envisaged that in the USA after the changes brought about by deregulation in the 1980’s, the new contract structure would allow LSPs to become, “familiar with the repeated operations they would perform” and thus be able, through the experience curve that had been

researched in organisational learning, “to deliver savings to the contract”. Beier (1989) concluded this would have advantages to both parties – the Shipper would benefit from improved efficiencies and effectiveness and the Carrier would have the opportunity to “use (their) accumulated experience to differentiate their services, and stabilise their position in the channel of distribution”.

He identified that there was another opportunity for this “experience” to generate savings in the interaction between the Carrier **and** the Consignee.

“Because the carrier views the transactions from a unique perspective different from either of the other two parties, it may be able to identify and pass on information which could lead to more efficient transaction processing between them”

Beier, 1989

Beier suggested that the logistics triad of the Consignor-Carrier-Consignee should be the, “minimum unit of analysis when studying experience and other forms of logistics trade-offs”. The challenge for the triad members would be to be able to “monitor improvements and distribute the costs and benefits” (Beier, 1989).

It was a theoretical paper unproven by empirical research, but nevertheless introduced a number of important concepts and ideas. He concluded that “a new degree of openness not found in many logistics channels” was required and foresaw that Shippers would do best if they were to bring their problem and experience saving skills to the contract as well as their core skill of goods movement and act as a “consultant-middleman” in “synchronising all phases of the goods movement between the Consignor and the Consignee” (Beier, 1989).

Little research in the field of “tripartite logistics” followed for a number of years with the exception of Larson (1992). He argued that the quality loss function (QLF) deployed by academics such as Taguchi et al (1989) failed to include total logistics costs such as loss of sales, storage and transportation. “The QLF should be extended to the inter-organisational logistics triad”, he concluded. In 1994 Larson in an empirical study found a, “significant relationship between inter-organisational integration (between Buyers and Sellers) and total costs” and suggested that logistics

could extend its leadership role in, “promoting functional integration.....and TQM (Total Quality Management)”. He suggested that “extending empirical research to study pipeline functional integration across the logistics triad.... would be an important area of further study” (Larson, 1994).

Hagan (1994) also questioned the role of the LSP in their relationships between the customers they linked together; the suppliers, manufacturers, retailers, and wholesalers. He called for a new “mind-set” and “radical new thinking” in the way the role of the LSP was conceived suggesting that, “logistics managers should grasp the initiative by being an active partner in the supplier-customer dialogue..... (to ensure) the value of logistics to that dialogue is emphasised”.

Gentry (1996) postulated that, “increasing the carriers’ involvement within existing buyer-seller partnerships may allow additional opportunities for cost savings, service improvements, and increased equipment for both partners over time”. This in turn would help to reinforce the strategic partnering stance.

She found that Carriers involved in Buyer-Seller partnerships were viewed differently (Carriers were considered to perform a more important role and were more likely to have partnering relations within the Buyer-Seller partnering relations) compared to Carriers used in non-partnering Buyer-Seller relations. There was no difference in perceived Carrier importance as viewed from either the Buyer (Consignor) or the Seller (Consignee) in Buyer-Seller partnerships.

Interestingly, what she did not find was the involvement of the LSP in the long term strategic planning process. Thus, she concluded,

“additional improvements can be realised by increasing the involvement of the carrier in the strategic planning process” Gentry (1996)

Her research also found that when a single Carrier was used there was more likely to be a trusting environment (there was less likelihood of a contract ending penalty clause). In addition, if there were service problems the triadic alliance were more likely to work cooperatively together to find solutions. Finally she found that joint

management of Carriers, although rare, did lead to an increase in joint problem solving efforts with Carriers, use of long-term contracts with Carriers and dedication of equipment or drivers with Carriers.

This was a significant set of findings and provided clear evidence that if, “the Buyer-Seller partnership also included the Carrier then this multi-firm alliance could be viewed as a segment of the overall supply chain” (Gentry, 1996). Carrier integration supports the competitive position of all of the supply chain partners.

In 1998 Larson returned to the logistics triad in a paper which focussed on carrier reduction. He found that although there had been little research on carrier reduction the literature and his research did support the conclusion that this strategy can “both improve transportation/logistics performance and enhance shipper/carrier relations.....previous research also suggests there are interactive links between carrier reduction and some other programs such as EDI (Electronic Data Interchange) and JIT (just in time)” (Larson, 1998). He again concluded that “an important next step would be to investigate movement (in carrier reduction) toward integrated logistics triads”.

A further academic who did include the logistics triad in his research was Bask (2001). She envisaged, as has been stated, that the triadic approach was “the most satisfactory starting point for matching logistics service/services to seller-buyer relationships in supply chains”, and developed the basic diagram which conceptualises the logistics triad which he argued was made up of three dyadic relationships. A version of this diagram to highlight the basic logistics triad structure and the relationships that are focussed upon, has been deployed throughout this study.

She defined triadic relationships as,

“relationships between interfaces in the supply chains and third-party logistics providers, where logistics services are offered, from basic to customised ones, in a shorter or longer term relationship, with the aim of effectiveness and efficiency”.

Bask, 2001

She explored the need for third party providers (as supply chain “supporters”) to contingently manage their business according to the contextual supply chain needs. Bask’s contribution was important at many levels. She gave credence to many of the themes that Beier (1989) had raised and Gentry (1996) had investigated, whilst arguing that logistics service provision had to be modernised and become more aligned with overall supply chain strategy. In relation to pursuing a supply chain orientated strategy he emphasised that focussing solely on the dyadic relationship was restricting potential and was therefore implicitly limiting.

“the dyadic relationship is inherently limiting and could lead to sub-optimisation”

Bask, 2001

Larson and Gammelgaard (2001) further developed the triad concept through a survey of logistics firms in Denmark, and provided the definition of the logistics triad used in this study as follows; “a cooperative, three way relationship among a buyer of goods, the supplier of those goods, and an LSP moving and/or storing the goods between the buyer and the seller”. They supported Gentry’s (1996) findings, concluding that the triad benefits included “greater flexibility, higher inventory availability, more on time pick up and delivery, and lower (transport, warehousing, and inventory) costs”. They added that the formation of triads was facilitated by just in time delivery, adoption of developments in ICT and closer Buyer/Seller relationships. Finally, they noted that there were a number of barriers to triad development including, “lack of coordination among the parties, lack of (technology or relational) expertise within the parties, and power imbalances among the parties” (Larson and Gammelgaard, 2001).

2.6.4 Tripartite Relations

Although it may seem intuitive that logistics provision is managed through a logistics triad, as the LSP physically links the primary supply chain members, the Buyer and the Seller, together the logistics triad is a challenging concept. Forming and maintaining dyadic relations, as has been noted in this Literature Review, are demanding enough without adding more complexity in terms of a third party. Fundamentally, the problem in managing relationships is that each organisation will quite naturally pursue their own objectives. “They may also compete for position

within their own supply chain, or shares of profits” Skjøtt-Larsen et al (2007). Moreover, Skjøtt-Larsen et al (2007) note that “the supply chain (members of the logistics triad) may also share members with other supply chains (triads)”. They go on to state that “demands by more than one organisation on the resources of individual member firms create problems for competition between members”.

In essence what this points to is that the logistics triad is an example of a mini Network, a concept which was introduced earlier in the Literature Review as a form of governance which exists between the Market and Hierarchy alternatives. Network is an all embracing term that can be used to describe all types of set up from simple dyadic partnering to multi-firm networked consortia. Christensen et al (1990) summarises the major attributes of a network relationship as follows:

- Δ *“Two or more firms must have some sort of commercial relationship;*
- Δ *Each of these firms is dependant on assets controlled by other partners in the network;*
- Δ *The partners in a network have some form of independence as well;*
- Δ *A network relationship needs transaction specific investments from both sides that are of semi-specific character. It takes time to develop such relationships;*
- Δ *A firm can take part in more than one network;*
- Δ *Different power structures can be identified. One model identifies an asymmetric power structure where a hub determines the network. Another model is based on a more symmetric balance of power between the partners;*
- Δ *Inside a network, there must be some incentives available to govern the exchanges. Agreements rely on negotiations and consensus;*
- Δ *Management of networks will be organised according to the strategic interest of the partners and the power structure involved. It can take the form of a formal economic approach based on self-interest or a form based on trust and behavioural adaptation”*

In summary, adopting a network perspective such as a logistics triad through collaboration can realise many competitive benefits, but it is also made up of many elements and can be quite onerous – especially adding a third organisation (or more).

Within SCM as Skjøtt-Larsen et al (2007) notes, “the primary task is to integrate each stage into a larger system.....individual organisations at each stage still manage resources, set objectives, and pursue individual objectives”. The research will study whether it is possible to align interests across a triad to the common goal of better supply chain performance.

2.7 Underpinning Theories in SCM and Logistics Management

The penultimate task of this Literature Review before the conceptual and methodological gaps in the literature are outlined and initial research questions are presented is to review some of the relevant theories which underpin this area of research. However, in selecting theories that explain a supply chain orientation and consequent relationship behaviour, it must at the outset be noted that this is not a straightforward task. Relationship management within the framework of SCM is a boundary-spanning area and therefore behaviour cannot be explained by any single theory. Therefore a number of theories need to be critically evaluated to better comprehend this area (Halldorsson et al, 2007)

The theory of Transaction Cost Economics has already been introduced. This has helped to explain the governance structure of the supply chain, the boundaries of each firm (all be it using cost as the sole constituent of value). Four further theories which further help to explain SCM and show how its adoption can form the basis of a sustainable competitive strategy are set out below.

2.7.1 Systems Theory

Systems theory (von Bertalanffy, 1950) underpins the SCM discipline (Giannakis et al, 2004). “The systematic properties are the interdependence of activities, organisations and processes” (Skjøtt-Larsen et al, 2007). Scientific research was mainly based on reductionism until the 1930’s (Anderson, 2001), where the behaviour of the whole could be explained by the individual parts. Von Bertalanffy challenged reductionism with holism in the form of systems theory. The whole may be greater than the sum of

its parts. SCM, can be set within this context, has developed as a holistic approach to industrial organisations and their supply systems (Figure 32).

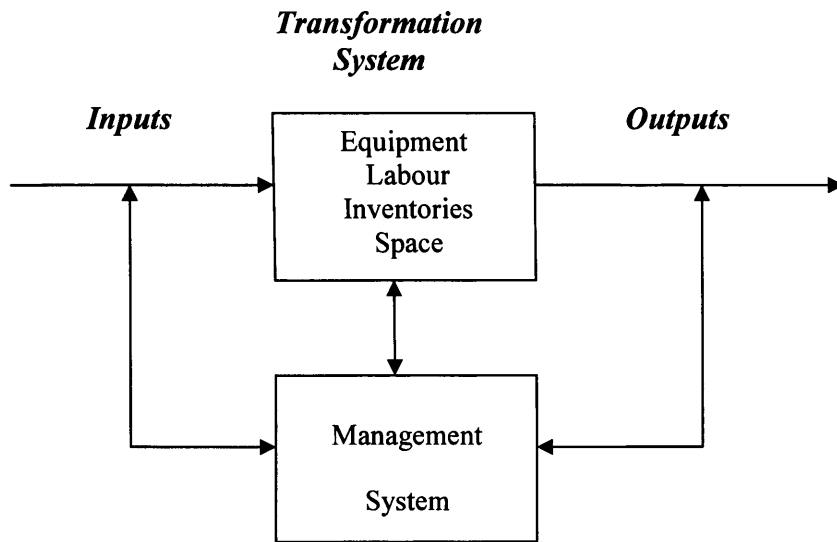


Figure 31: A Holistic Approach to Industrial Organisation and Supply Systems - an organisation as an input-output transformation system (Leenders and Blenkthorn, 1988)

The supply chain could be described as just such a system, or rather a series of interlocking systems, which all need to be managed to optimise a collective unified whole. Baily and Farmer, (1977) envisage the supply chain as made up essentially of four system types:

- Δ **An operating system** – the basic business process of what has become known as the value chain;
- Δ **An information system** – which supports the coordination of the operating system and is able to sense the market;
- Δ **An adaptive system** – which is concerned with successfully adapting the organisation to the environment through management to ensure continued effectiveness;
- Δ **A maintenance system** - which exists to ensure the organisation keeps working effectively

To illustrate this inter-dependence of elements within the system, a simple example can be summarised which relates to the logistics triad. For instance, the reliability of transport and improved transit times will have a direct bearing on how much inventory has to be held. A further facet of conceiving the supply chain as a system is the presence of the phenomenon known as the “bullwhip effect” (Lee et al, 1997) which interacts throughout the chain of supply. Forrester (1961), through the use of a simple simulation model, showed how the variance of end user demand could be amplified as it moves up the supply chain system. A taxonomy of causes of demand amplification or bullwhip was developed by Disney and Towill (2003) and included factors such as time delays, order batching effects (Burbidge, 1961), and rationing and gaming (Houlihan, 1985). In short supply chains are dynamic systems.

These effects plus other inefficiencies such as duplication of activities, which result in risk aversion strategies, large stock-piles of inventory and other symptoms of uncoordinated inter-company processes, can be overcome through vertical integration, it is argued. In brief terms this is a core theoretical validation of the strength of developing a supply chain orientation.

The next section aims to explain the theory behind the view that by successfully adopting a SCM strategy a sustainable competitive advantage can be realised.

2.7.2 Theories of Competitive Advantage

Porter (1985) suggests that a firm’s value chain, in that it can contain differences to others, can become a source of competitive advantage. This leads to the question, how is competitive advantage achieved through a firm taking a supply chain orientation? Competitive advantage is derived from creating cost or differentiation advantages whilst creating customer value (Barney, 1991; Prahalad and Hamel, 1990). Sustaining competitive advantage requires the establishment of barriers which make copying difficult and continuous improvement and innovation further sustains the advantage (Day and Wensley, 1988).

Porter (1991) envisaged that competitive advantage could therefore be derived from the value chain – the activities which created customer value such as production,

marketing and delivery. By extending the value chain to buyers and suppliers the basis of competing through the value system could be developed, although Stank et al, (2005) noted that “the “Porter Framework” did not provide specific guidance on how to manage these activities to create competitive advantage”.

Stank et al, 2005 set out a strategic framework to fill this void using two theoretical paradigms to underpin their framework: the Strategy–Structure–Performance paradigm and the Resource Based paradigm. This is worth exploring for two reasons. Firstly, between them they help to support the notion that SCM is a strategic level concept. Further, they help to further explore the relationship between SCM and logistics began earlier, which can in turn be used in the study’s exploration of the logistics triad. Proponents suggest that the third party logistics form is a source of strategic competitive advantage in that it offers a number of value adding services in response to the increasing demands from integrated supply chains for on-time deliveries of customer adapted services and products internationally (Gol and Catay, 2007).

2.7.2.1 The Resource Based View (RBV)

The RBV identifies competitive advantage can be derived from a firm’s internal capabilities and resources as opposed to its product outputs (Barney, 1991). *Resources* are the firm’s assets which may be tangible such as machinery and skilled personnel, or intangible such as a brand reputation, or trade contracts (Wernerfelt, 1984). The presence of trust, commitment and cooperation in an inter-firm alliance would also be considered as an intangible resource (Webster, 1992). *Capabilities* are processes or routines – coordinated ways of managing the resources (Morgan, Strong and McGuinness, 2003).

A *competency* arrives from the ability of a firm to manage a collection of these capabilities better than another firm (Day, 1994). This clearly can include boundary spanning processes between firms and thus RBV can explain why SCM is attractive as a potential source of sustainable competitive advantage. Managing processes across the boundary of the firm well, through a resource such as a collaborative understanding, and developing capabilities across a range of interface processes, is hard to imitate, it is argued, and can lead to a position of competitive advantage. As

long as this position is supported by continuous innovation and improvement sustainable competitive advantage ability can be achieved.

The RBV does not explicitly state what the resources are that lead to a competitive advantage (Holweg and Pil, 2008, Williamson, 1999) but the theory does highlight that the resources are useful when they are rare and/or difficult to imitate (Barney, 1991).

2.7.2.2 Strategy-Structure-Performance (SSP)

An additional and complimentary explanation which is used to explain superior performance and potentially provides a strategic explanation for supply chain configurations and its sub elements such as the logistics triad, is the SSP paradigm. Where a firm has a close fit between its structure and strategy it is argued that it will out-perform a firm without the same degree of alignment (Child, 1972). Stank et al (2005) argued that this can be explored at three levels; the corporate level, the business unit level and the functional level. They showed that alignment of strategy, structure and consequently performance (output, growth, profitability and technological advancement) can be pursued and realised.

This again acts as an explanation of sustainable competitive advantage because strategy and structures are hard for competitors to easily copy. The logistics triad represents a potential structure within the supply chain and therefore if the strategy deployed successfully exploits the triad, this could be a source of sustainable competitive advantage based on the SSP theory.

This paradigm provides an explanation that can be used by critics of neo-classical economists who challenge the view discussed earlier, that barriers to competition are at best temporary and thus markets will naturally revert to a state of perfect competition in the medium to long term. Instead, it supports the argument that competition is in fact imperfect and that certain structures, whether contained within a firm, within a supply chain or within a supply network, will represent fairly unique structures that may be hard to copy even in the medium to longer term and therefore may be exploited as differences by the firms involved to underpin a sustainable competitive advantage.

Clearly, there is much argument surrounding this notion and it is attacked for its short-termism and inability to predict future performance. Nevertheless, it provides a powerful argument behind firms taking up a supply chain orientation and pursuing a network structure which, this study explores could contain logistics triads.

2.7.2.3 The Principal Agency Theory

Once a decision has been taken to outsource an economic activity, various problems may arise due to the separation of ownership and control. These problems may include “asymmetric information between the principal and the agent, conflicting objectives, differences in risk aversion, outcome uncertainty, behaviour based on self-interest, and bounded rationality” (Halldorsson et al, 2007). To attempt to overcome this, a contract between the two parties can be drawn up. The aim is to simultaneously militate against conflicts whilst also motivating the agent to act in the best interests of the principal (Eisenhardt, 1989a, Logan, 2000). Contracts therefore, invariably contain a balance of rewards and penalties to stimulate the right behaviour. In theoretical terms this is called the “Principal Agent Theory” or “Agency Theory”.

Alignment of behaviour is a critical underpinning issue in SCM (Halldorsson et al, 2007). However, this becomes more problematic in the logistics triad. For Relationships One and Two, as has been discussed, the relationship is invariably more formal and underpinned by an agreed contract. However, in Relationship Three this invariably is not the case. The relationship is much more informal and is not supported or underpinned by a contract. And for the triad as a whole there are four sets of relationships to be managed.

The decision to outsource an activity such as logistics inevitably increases the complexity of the task of alignment. If this can be overcome there is potential for competitive advantage to be realised, although Agency theory does pose some interesting issues to be considered in this regard.

2.7.2.4 Network Theory

To explain the power of relationships as a potential source of competitive advantage, Network Theory has been postulated as a plausible underpinning explanation

(Halldorsson et al, 2007). If two companies develop a relationship, their combined resource may achieve more advantages than if a company operated individually. The value of this advantage as a resource can be derived from how it may be combined with other resources.

However, Network Theory goes further than this in that it argues that the idea of a network boundary is hard to delineate or define. Network theory envisages that a firm should not be conceived of as a single entity but as a quasi-organisation with its performance not only influenced by relationships it develops with its direct partners but also these partners own relationships and so on. This definition of a network assumes no rational boundaries can objectively be conceived in the “industrial network” the firm operates within.

Artificial boundaries can be assumed, such as a dyadic partnership, or the supply chain. Indeed, the logistics triad is essentially a delimited network, which, by its very nature also needs to be conceived of within the wider industrial network it exists within. In “making sense of the network”, Hakansson and Ford (2002) stated;

“There is no single, objective network...there is no single complete or correct description of it. It is not the company’s network. No one owns it. No companies manage it, although all try to manage in it. No company is the hub of the network. It has no centre, although many companies believe they are at the centre”.

This is very insightful and helps to underline that all entities within the logistics triad will have their own perceived picture of their own network they are operating within (Hakansson and Ford, 2002).

Johanson and Mattsson (1987) explain that links between firms in a network may develop through two different but inter-twined interactions they term as exchange processes and adaptation processes: exchange processes include information, goods and services, and social interactions while adaptation processes are the support processes such as personal, technical, legal, administrative and logistics activities.

Fundamentally, in the logistics triad the core exchange process occurs clearly between the Buyer and Seller while the LSP is providing an adaptation process. However, in every relationship there are elements of exchange and adaptive processes occurring.

Halldorsson et al, (2007) describe Network Theory as primarily, “descriptive in nature”, but it is useful in helping to explain that the logistics triad is an important conceptual framework to manage outsourced logistics from within.

Finally, an underpinning theory in terms of inter-relationship management from organisational and legal sciences (although it only marginally contributes to an understanding of sustainable competitive advantage), needs to be set out – Relational Contract Theory.

2.7.3 Relational Contract Theory

Among the dyadic relationships in the logistics triad, Relationship 3 is unique as it invariably is not underpinned by a contract. However, does this matter? There are a number of academics who argue that a contract is not an essential prerequisite of a successful relationship. Indeed, they argue a formal contract is by its very nature inadequate to cover the complex nuances involved in modern collaborative relations and if they do exist may actually restrict the potential development of the inter-relationship. To explain this, a discussion around the Theory of Relational Contract is useful to set out.

Of particular relevance here is reference to MacNeil who has done much to explain the theory when reflecting upon the law of contract. First, the constituent elements of contract from a legal perspective can be clarified. MacNeil (1969) identifies five basic elements of contract:

- Δ Co-operation,
- Δ Economic exchange,
- Δ Planning for the future,
- Δ Potential external sanctions,
- Δ Social control and manipulation

MacNeil's argument chimes with much of the issues inherent in the conceptualisation of inter-relationship management, which has been set out in this study. MacNeil has contributed much to challenging what is termed as classical contractual law by introducing the challenging notion that in fact contracts invariably require an underpinning of a relationship as well. In classical law this "relationship" is not assumed as it presumes that people are "value maximisers" and hence will pursue matters with the goal of optimising their own self-interest.

Instead, MacNeil proposes that individual behaviour cannot be claimed to be so selfish and that in reality they are essentially cooperative in nature. Indeed, he mirrors the spectrum of relationships discussed earlier in the Literature Review in envisaging a spectrum of contracts from the purely discrete to more relational based contractual arrangements. This is conceptually fundamentally different to classical contract theory which envisages a narrower spectrum based on the purely discrete version of contract. MacNeil's criticism of this kind of contract is that, "it does not take into account the co-ordinated, relational phenomena" (Campbell, 2004).

Relational exchange cannot be viewed solely on cost, MacNeil argues: it also involves wider social exchange and is hence much more complex than neo-classical economist and classical law would pigeon-hole them as. The difference is a social aspect and has been termed as the "invisible hand" – this is not even often conscious to the individual so of course their agreements are not framed to express it. Consequently, although a contract may exist, often the relationship occurs and develops above it causing some writers to argue that the contract itself is not worth the paper it is written on - "they get written and agreed and put in a drawer and forgotten about"!

If this is so, does the absence of a contract in Relationship 3 matter? If a relationship can grow between the two parties is the absence of a contractual footing significant? One relevant question to ask here is does Relationship 3 involve economic exchange? MacNeil defines economic exchange as simply the way specialists distribute their work products among themselves in a reciprocal manner. This idea implies, "giving up something in return for receiving something else" (MacNeil, 1986). However, MacNeil emphasises that this does not necessarily need to include money in the exchange or reciprocal payment. So this goes beyond capitalist exchange – it could be

the exchange is anything that may be valued by the other party – also of interest this exchange does not have to be even but there does have to be an element of mutuality

So the Theory of Relational Contract should be seen in its widest possible sense. To understand the role of the players in the dyadic exchanges in the triad and the tripartite exchange as a whole, a much wider view of utility than just a financial perspective should be taken – “it must be social as human life is social” (Campbell, 2004). At the core of this thinking MacNeil states this:

“As students of man in society, we are faced with man’s illogicality.

Man is both entirely selfish and an entirely social creature in that man puts the interests of his fellows ahead of his own interests at the same time as he puts his own interests first.

Such a creature is schizophrenic, and will, to the extent that it does anything except vibrate in utter frustration constantly alternate between inconsistent behaviours – selfish one second and self-sacrificing the next.

Man is, in the most fundamental sense of the word, irrational and no amount of reassessing, no matter how sophisticated will produce a complete and consistent account of human behaviour, customs or institutions.

(MacNeil, 1983).

“Let me add – that both neo-classical economics and neo-classical contract law have proper, although limited roles in social analysis.

.....These limited roles are intellectually difficult to deal with, because both are closed systems which deny, yet inconsistently postulate, an external social structure in which they operate.”

(MacNeil 1985)

In summary, MacNeil’s work helps to endorse the view that any inter-relationship is more complex than can be explained by pursuing purely quantitative explanations. Relationships are by their very nature social and therefore need to be also examined through a qualitative lens if a better understanding of them is to be generated. This also means that each inter-relationship is unique and that although some generic

understanding can be gleaned by researching a “typical” case study, care must be taken in over stating the case for generalising theory from the findings.

Specifically in terms of a contract – or lack of a contract – the theory would suggest that the absence of a contract can be overcome and hence the lack of a contract in Relationship 3, and across the logistics triad as a whole in terms of the tripartite relationship, should not in itself be a confining factor to the respective relationships’ success.

2.7.4 Conclusions

This review of a range of relevant theories underpinning the understanding of logistics relationship management within the field of SCM has illustrated that no one theory can be promoted as a satisfactory explanation in this field of study. It is by its very nature inter-disciplinary.

Indeed, there are many other possible theories which could be included in this summary, such as the theory of Organisational Learning, so this list should not be seen as exhaustive. Nevertheless, assessing the results attained in this research against this theoretical base will strengthen the findings and support the assertion of any contributions to knowledge.

2.8 Confirming the Literature Gaps in Relation to the Logistics Triad

Whilst this chapter has presented so far an overview of the pertinent ideas and theories related to the logistics triad concept the ultimate aim of the literature review should be to critically examine the literature to identify the relevant gaps. This should be from conceptual and methodological perspectives and is consequently the purpose of this section.

2.8.1 Identifying the Conceptual Gaps

The literature review has highlighted that dyadic relationships have been extensively studied, especially over the last couple of decades. Their development has been shown to be an important constituent of the development of more integrated supply chains and better optimised processes through the pursuit of the theories espoused by SCM. Thus questions emerge surrounding the issue of whether the knowledge and understanding that has been generated in studying the dyad equally apply to the triad, or whether the unique aspects of the triad make it a new and different phenomenon to operate and hence to study?

The evidence accumulated through this literature review highlights that although dyadic and triadic inter-organisational relationship management is broadly in the same field of research there are marked differences which make them unique and therefore warrant researching as a separate area of study. Logistics triads, it has been argued are different supply chain entities to the contract based dyadic inter-organisational relationships. The principal differences in the triadic and dyadic concepts, which have been introduced in the literature review, are listed below:

- △ Logistics triads are more complex than dyadic inter-organisational relationships which may exist along the chain of supply. This is fundamentally driven by the fact that the logistics triad contains four inter-organisational relationships (3 dyadic and one tripartite), not the single link contained in the standard dyad.
- △ Two of the key points which emerge from this are that:
 - The tripartite inter-organisational relationship is influenced not just by each of the three parties involved but also by the state of each of the three dyadic inter-organisational relationships as well
 - and
 - For each party, one of the dyadic inter-organisational relationships is completely removed from their vision. For example the Buyer-Seller relationship is not directly visible to the LSP, and the un-contracted inter-organisational relationship

between the LSP and the Consignee is not directly visible to the Consignor.

- △ The logistics triad also contains some different challenges which in addition make it a different entity
 - Objectives have to be shared by three players not two
 - Measures and measurement systems have to be shared by three players not two
 - Each of the three dyadic inter-organisational relationships and the tripartite link, in theory, have to be managed in parallel with each other not as separate entities.

It is interesting here to note that few researchers have followed up initial findings and ideas in the field even though the same authors have identified the existence of the logistics triad concept and the fact that “additional improvements can be realised by increasing the involvement of the carrier in the strategic planning process” (Gentry, 1996).

From the literature review a range of issues surrounding the basic notion of the feasibility of the logistics triad emerge particularly around the basic notion of the feasibility of the logistics triad concept. The feasibility to:

- △ Set up and sustain a three-way inter-organisational relationship
- △ Manage three dyadic inter-organisational relationships and one tripartite inter-organisational relationship in parallel
- △ Identify and pursue jointly held objectives supported by a jointly shared measurement system across the triad
- △ Effectively lead a logistics triad
- △ Mutually share the risks and benefits inherent across the logistics triad
- △ Effectively set up and sustain an effective inter-organisational dyadic relationship within the triad which is not supported with the foundation of a contracted base
- △ Pursue the ideals of the logistics triad from a business sense – i.e. making the case that it makes commercial sense to set up and sustain the logistics triad

Despite the paucity of research on the logistics triad there have been a few notable contributions which have begun to partially address these issues. As described above Gentry (1996) found that carriers involved in the Buyer and Seller partnership were viewed differently compared to carriers involved in non-partnering Buyer and Seller relations. In addition, she found that if there were problems, the triadic alliance was more likely to work cooperatively together. Larson and Gammelgaard (2001) supported these findings and additionally found that the triad benefits included “greater flexibility, higher inventory availability, more on time pick up and delivery and lower (logistics) costs”. They also found that there were a number of barriers to logistics triad formation including “lack of coordination among the parties, lack of technology, lack of relevant expertise and power imbalances”.

There are however, a number of conceptual gaps in the literature on logistics triads. This can be highlighted by taking the list of issues surrounding the feasibility of the logistics triad and highlighting where gaps in the knowledge base have been highlighted through the literature review (Table 6).

As a relatively under-developed area of study it is perhaps unsurprising that it is relatively straight forward to identify a wide range of gaps in the literature related to the logistics triad. This is particularly apparent when the research level is related to the breadth and depth of literature that has led to the better understanding of dyadic inter-organisational relationships in recent years. It points to two fundamental questions which are proposed to be addressed at the core of the research in this study:

△ How suitable is the logistics triad as a unit of analysis in supporting the role of modern outsourced logistics within the setting and goals of supply chain management?

△ How should a logistics triad be managed so that the inherent opportunities are realised and the barriers overcome?

In addition to the conceptual gaps there are also methodological gaps in previous research activity on the logistics triad.

<p>Issues surrounding the basic feasibility of the logistics triad concept and the relevant research which has addressed these issues at either the dyadic or triadic level</p>	<p>Gap in the existing research</p>
<p><i>To set up and sustain a three-way inter-organisational relationship</i></p> <p>Gentry (1996) and Larson & Gammelgaard (2001) observed existing triads</p>	<p>No research has been conducted observing the set up and maintenance of a new logistics triad</p>
<p><i>To manage three dyadic and one tripartite inter-organisational relationships in parallel</i></p> <p>Research has looked at the importance of juggling relationships (e.g. Hertz and Alfredson, 2003) and building supply chain collaboration (e.g. Whipple and Russell, 2007)</p>	<p>No research has been undertaken which asks how all the inter-organisational relationships in the logistics triad can be managed in parallel</p>
<p><i>To identify and pursue jointly held objectives supported by a jointly shared measurement system aligned to supply chain goals</i></p> <p>Many authors have looked at the development of measures in this way across the dyad (e.g. Whipple and Frankel 2000) and across a supply chain network or system (e.g. Fawcett and Clinton, 1996, Simatupang and Sridharan, 2002)</p>	<p>No research has been found that has specifically studied the development of jointly held measures across the logistics triad</p>
<p><i>To effectively lead a logistics triad</i></p> <p>Various studies have been carried out looking at trust and leadership (e.g. Den Hartog, 2003). Larson (1994) suggested that LSPs should “extend their leadership role” in the supply chain.</p>	<p>No empirical research has been carried out exploring whether LSPs can become effective leaders in a logistics triad</p>

<p><i>To mutually share the risks and benefits inherent across the logistics triad</i></p> <p>Beier (1989) put forward the idea that he could conceive benefit for all involved players in pursuing a logistics triad.</p> <p>Gentry (1996) found that increasing the carrier's involvement in buyer-seller relationships produced benefits.</p>	<p>No study has researched the issues surrounding mutuality, specifically in relation to the logistics triad.</p>
<p><i>To effectively set up and sustain an effective inter-organisational dyadic relationship within the triad which is not supported with the foundation of a contracted base</i></p> <p>Most research in inter-organisational relationship in the SCM literature has concentrated on the Buyer/Seller and Shipper/LSP interfaces – both invariably exhibit contractual foundations</p>	<p>Virtually no research has been carried out on the non-contractually based inter-organisational link between the LSP and the Consignee</p>
<p><i>To pursue the ideals of the logistics triad from a business sense</i></p> <p>Beier (1989) argued that the logistics triad was a good idea.</p> <p>Gentry (1996) and Larson & Gammelgaard (2001) confirmed some of its benefits and concerns</p>	<p>No research has been undertaken to investigate the basic feasibility of the logistics triad concept</p>

Table 6: Highlighting the Conceptual Gaps in Research Relating to the Logistics Triad

2.8.2 Identifying the Methodological Research Gaps

Much of the research on the logistics triad has been from either a conceptual perspective (Beier, 1989) or from questionnaires (Gentry, 1996, Bask, 2001 and Larson and Gammelgaard, 2001). This suggests a second gap field in the current research portfolio, which is examined in Figure 32. This charts previous research activity on the logistics triad on two dimensions – empirical and conceptual on one axis and primary or secondary on the other. It helps to confirm the point that apart from two brief case studies presented by Larson and Gammelgaard (2001) there has been **no** in depth study of a logistics triad in practice. Certainly there has been no

empirical study of a logistics triad being established and operationalised with changes in performance recorded over a longitudinal time span.

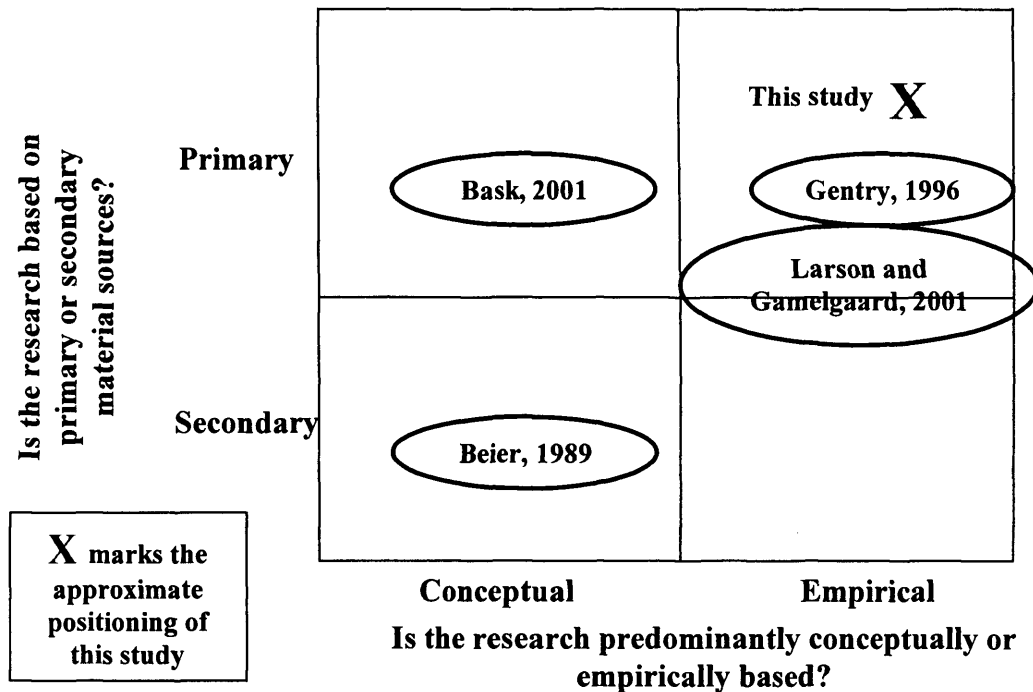


Figure 32: A Summary of the Positioning of Notable Previous Research Studies and this Research Thesis

This research study attempts to focus on the identified void with the purpose of gaining a deeper understanding of how misalignment of goals between the three players of a logistics triad may impact on their inter-relationships and on the overall supply chain performance.

2.9 Research Questions and Conclusions

This chapter has presented a broad overview of the pertinent literature relevant to the notion of the logistics triad. It has been predominantly framed by the four inherent inter-organisational relationships present in the triad and has proposed that the provision of logistics should be conceived of within the wider setting of the supply chain and the contingent supply chain strategy.

From the outset, the initial question which was outlined at the beginning of the research was addressed and was used to set out the broad parameters defining the problematic boundary of the study. The question was as follows:

“What is the influence of modern Supply Chain Management thinking in the way outsourced logistics provision is conceived and practiced?”

From this very broad background question more specific questions were drawn up using the findings from the Literature Review and the Exploratory Inductive Study to be presented in Chapter 4. An important research gap surrounding the logistics triad concept of the logistics triad was identified and the research focus was further to address these. The case that the logistics triad was more than just three separate dyad inter-organisational relations which could be treated as separate entities was made. It was argued that the triad had unique conceptual aspects which clearly demarked it as worthy of separate study and focus. It was also noted that although some authors had argued that the logistics triad represented a core building block of logistics provision in the supply chain (Bask, 2001), little empirical research activity had been carried out in this field of study. The research in particular therefore, aimed to gain a deeper understanding of how improved information sharing and better alignment of performance measures between the three players of the logistics triad may impact on their inter-relationships and overall supply chain performance.

This can be summarised in the two principal research questions:

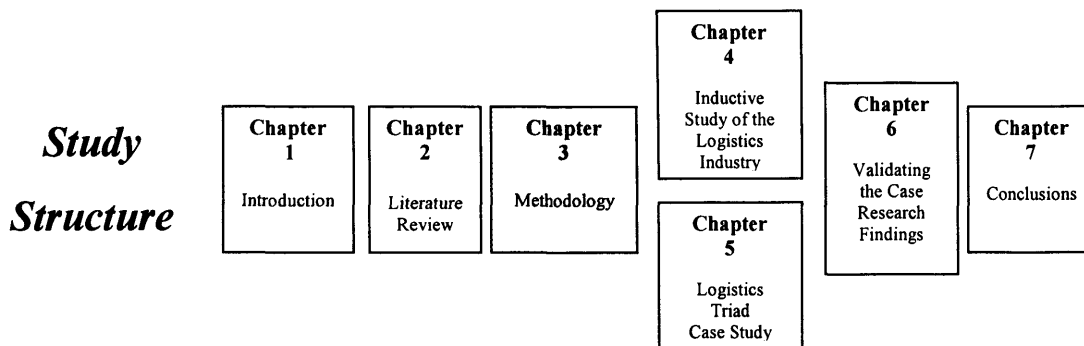
Δ How suitable is the logistics triad as a unit of analysis in supporting the role of modern outsourced logistics within the setting and goals of supply chain management?

Δ How should a logistics triad be managed so that the inherent opportunities are realised and the barriers overcome?

In the next chapter the Methodology deployed in this study is explained and justified.

Chapter 3

METHODOLOGY



3.1 Introduction

There are many intellectual and practical challenges facing management researchers. The nature of management research is exceptionally wide ranging and there are many policy debates which surround it. Fundamental to these debates are the questions of research for whom and research for what. Wilson (1998), asks is research for management or about managers and social organisations? In answering these questions and developing a coherent and defensible methodology, this chapter sets out first to briefly explain the issues which surround the debates over management research and secondly, given this background and the specific needs of this research study, to explain the methodological stances that have been taken.

3.2 The Management Research Debate

As introduced and explored in the Literature Review, there has been much debate concerning the central paradigm topic of this study, SCM, over whether it is an academic discipline or not (Croom et al, 2000, Burgess et al, 2006). However, this is not an issue that researchers in SCM uniquely face. Wilson (1998) suggests, “there is a quackery in every discipline.....but management does have its fair share”! Much of the debate in management research revolves around two issues; its fragmentation and its applied nature (Tranfield and Starkey, 1998). By exploring why management

research is so problematic, a clearer insight into the paradigmatic research issues specific to the field of SCM may also be inferred and gleaned. This is also of relevance to this research study.

Firstly the fragmentation will be examined, or rather, the lack of consensus in management research, which also, as was noted in the Literature Review, characterises the SCM domain. Is it healthy or unhealthy for the evolution of knowledge for the research area to be fragmented? Tranfield and Starkey (1998) in exploring this cite two authors who espouse opposing positions. Pfeffer (1993) argues that a lack of consensus resulting in a wide range of methodological and theoretical approaches holds back the advancement of science. Cannella and Paetzold (1994) on the other hand state that too much consensus control restricts the development of innovative thinking and thus holds back a scientific field.

So does an area of study like SCM need to have a tightly defined and commonly agreed definition and constructs to be accepted by the scientific community and thrive? In addressing this type of question across the management school as a whole, Tranfield and Starkey (1998) deployed Becher's (1989) analysis of research study developed from Biglan's (1973a) "cognitive dimensions" work, to develop "an analytical framework for exploring the attributes of subjects and the sociological properties of their disciplinary community networks" (Becher, 1989).

The first two can be organised onto a two by two matrix. On one dimension is "...the degree to which a paradigm exists" (Biglan, 1973a). In SCM it has been concluded by many academics that at best it may be considered as an emergent discipline (Burgess et al, 2006) so it would be placed at the "soft" rather than the "hard" end of the spectrum where for example physical or biological sciences could be placed (see Figure 33). One debate may be; should a field like SCM aim to move to the "hard" end of the spectrum, or is its more natural home at the "softer" end?

The second dimension concerns what Biglan (1973a) termed as "...the concern of the area with application to practical problems". Tranfield and Starkey (1998) identified this after the degree of fragmentation as their second key issue. What is pertinent here is to understand the logical progression of a discipline. If it is "pure" it would follow

that cumulative scientific gains could be built upon each new development relatively easily where as academic development in the more applied fields, where more environmental influences exist, would see progress being more problematic and classified as “applied”. Whilst in SCM there is some degree of “pure” research activity, there is also a wide range of “applied” material.

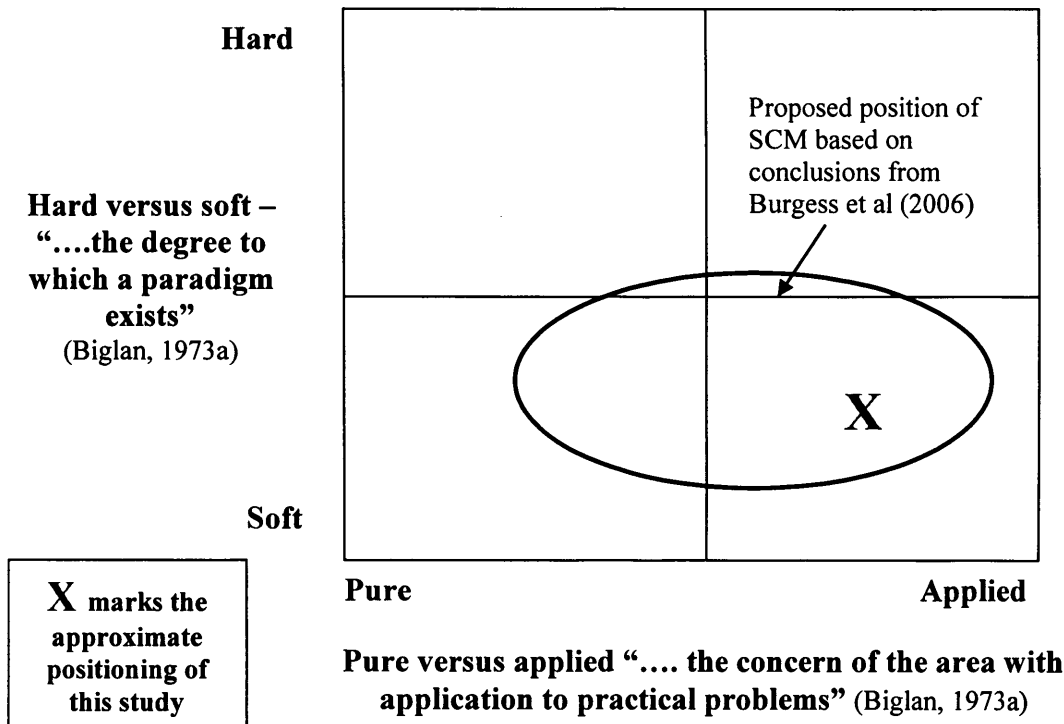


Figure 33: Cognitive Dimensions of Disciplines (Biglan 1973a) – cited in Tranfield and Starkey, 1998)

A discussion can be added here to highlight the positioning of this thesis. As a piece of SCM research, it fits into the “soft” categorisation on the first dimension. Along the theoretical and practical axis the research is deliberately positioned mid-way between theory and practice. In this sense it aims to be trans-disciplinary (Tranfield and Starkey, 1998). In addition, given that the study focuses on inter-relationships, it is by its very nature fairly applied and therefore should be placed in the appropriate half (Figure 33).

Tranfield and Starkey (1998) then add Becher’s (1989) two extra “sets of properties” (see Figure 34). Firstly, they address how “convergent” or “divergent” the discipline is; and second, what Becher terms as the “urban versus rural debate”. Again these two

dimensions can be plotted onto a two by two matrix and an approximate position given to the SCM domain. Firstly, the degree of divergence Becher (1989) suggests, is indicated by the sense of “togetherness and shared purpose” that can be sensed from an academic community. Moreover, another indicator is the degree of tolerance away from the normal ideological values. A “convergent” community would have a lower tolerance than a more “divergent” school. Tranfield and Starkey (1998) add that divergent communities would have “ragged discipline boundaries... which are seen as notoriously difficult to defend”.

SCM in its very nature as discussed in the Literature Review has roots in many academic discipline areas such as Operations Management, Marketing, Strategic Management, Industrial Economics, Inter-Organisational Behaviour, Systems Dynamics and Purchasing to name a few. As a consequence, Burgess et al (2006) conclude that it has no closely knit community. It can therefore be placed at the “divergent” end of the spectrum.

The “urban – rural” dimension is dictated to by the density of research activity in a particular area. An “urban” characterisation would indicate that the research activity would be highly concentrated with a large volume of researchers studying increasingly narrow areas of study. “Rural” environments describe more un-chartered areas of research study where because of the lack of research intensity the lines of demarcation are more poorly defined and the level of debate is arguably not as intellectually sophisticated. Placing SCM on this dimension is more problematic. Being relatively new (the term “supply chain management” was only coined in 1982 by Oliver and Weber) and has evolved in definitional terms since its inception, it would suggest that SCM should be characterised as more “rural” than “urban”. However, a large amount of research activity is focussed on the domain and especially in recent years a clearer idea of its constructs and dimensions has begun to emerge (Burgess et al, 2006); so placing it in the “urban” half, if only just, would be probably more appropriate.

It is interesting to also position this study on the rural – urban axis. In broad terms the research focuses on the subject of inter-relationship management involving logistics service provision within the setting of SCM. As has been noted, this is a fairly well

developed research domain. Therefore, it arguably should be placed, if only just, on the “urban” side of the spectrum rather than the “rural”. However, the narrower focus of the study is on the logistics triad, which is a much more under-developed notion containing considerably fewer notable research contributions. Indeed, it could be argued that it fits very well within the definition given to the “rural” end of the spectrum; “a more un-chartered area of research study where because of the lack of research intensity the lines of demarcation are more poorly defined” (Becher’s, 1989). The approximate position of this research study is thus marked by the letter X in Figure 34.

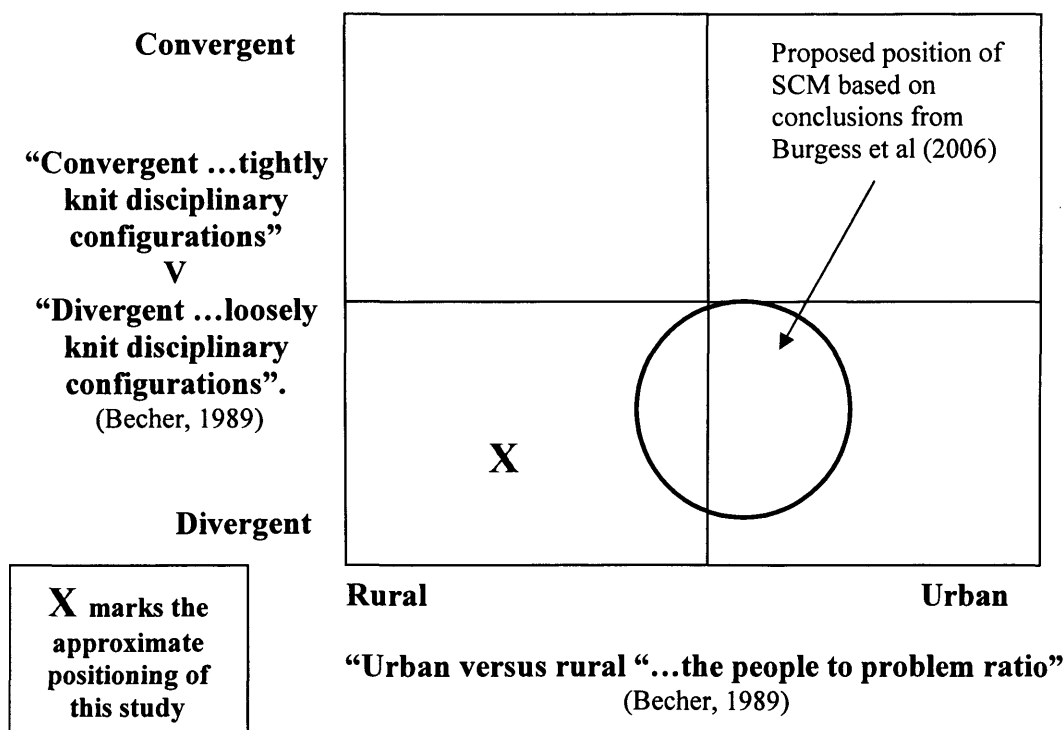


Figure 34: Mapping SCM and this research study on two further dimensions of the Social Organisation of Disciplines (from Becher, 1989 cited in Tranfield and Starkey, 1998).

In considering the application of Biglan’s (1973a and 1973b) and Becher’s (1989) “sets of properties”, Tranfield and Starkey (1998) ask what this means for research in the management field. They suggest that management research needs to avoid the dangers of becoming too removed from practice and hence of little relevance to management, or at the other extreme, too removed from theory and thus lacking in robustness as well as perhaps being over-influenced by the need for short term results.

However, “as management research is for management and about management successfully being close to innovation in practice as well as theory development, providing the standard is high enough, will provide findings with sufficient substance to aid scientific mapping as well as practitioner development” (Tranfield and Starkey, 1998).

They assert that “management research is concerned not only with knowing what, but goes beyond this to consider questions associated with knowing how”. “What is important is addressing the question what are the implications for management in this sense the very essence of management research in terms of its problem foci, its methods and its knowledge stock, is that each needs to be framed, produced and disseminated within a context of application” they conclude.

What does all this mean for research in management and in particular research in SCM and specifically in this study? Tranfield and Starkey (1998) argue that management research must be trans-disciplinary in that it must take a path which guards against at one extreme “academic fundamentalism” (Burgoyne, 1993) – academic progress in knowledge which the practitioner community feel is out of touch with the complexities of the real world situation – whilst at the other end of the spectrum is not too orientated to the practitioners and policy makers agenda whose agendas are often short term in nature. This is akin to what has been termed the Mode 2 agenda – Mode 1 being the traditional method of knowledge production whilst Mode 2 is, “characterised by a constant flow back and forth between the fundamental and the applied, between the theoretical and the applied” (Gibbons et al. 1994).

It is thus in this area that much of the research undertaken in this research study sits. Gibbons et al (1994), argue that “typically, discovery occurs in contexts where knowledge is developed for, and put to, use, while results – which would have traditionally been characterised as applied – fuel further theoretical advances”.

For Mode 2 type research production, Tranfield and Starkey (1998) state that “research problems should be framed in the context of application and research activity should be driven by trans-disciplinary concerns at the levels of both theory

and practice....thus enabling contribution to both (theory and practice) simultaneously”.

SCM is an applied field, quite unlike the purer fields of, for instance, the physical or biological sciences. There are many contingencies which need to be understood as well as a menu of potentially explanatory theory that can be used to aid explanation and understanding. The trans-disciplinary approach would appear to be appropriate.

However, treading this path is not easy. It is hoped that by taking this approach the relationship between theory and practice in this area will have been improved with the relevance and application of findings. Indeed, a virtuous circle (indicated in Figure 35) has emerged through this work of theory being informed by practice and then practice being informed by theory and so on.

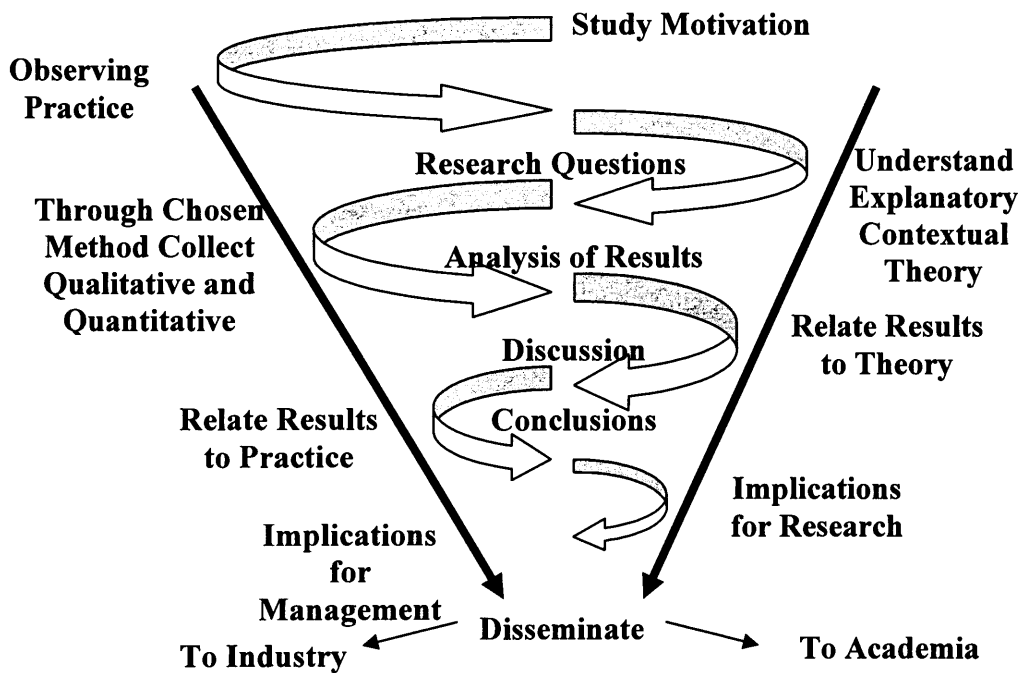


Figure 35: Producing Knowledge through a Trans-Disciplinary Approach

3.3 Methodological Issues

In the introductory chapter Burgess et al’s (2006) cataloguing paper for SCM research papers was discussed. The final grouping they propose concerns the methodological approaches taken to previous research in SCM. They highlight that in their

paradigmatic stance, the functionalist or positivist approach has been overwhelmingly dominant, with 97% indicating this. Only 1% had an interpretivist approach and only 2% held a radical structuralist approach. Selviaridis and Spring (2007), in their survey of research in the field of third party logistics, also confirm this, stating that in terms of deployed method most were based on surveys and were based on a positivist stance which traditionally has been dominant in logistics research (Ellram, 1996, Mentzer and Kahn, 1995).

Whilst a positivist stance is appealing, in reality business is a social science and what is observed is only part of the picture. For example, the notion of SCM is not always physically observable yet it has developed as a powerful force shaping thinking and decision making in the logistics arena. What is needed most, Selviaridis and Spring (2007) argue, is research which helps develop normative decision making frameworks in logistics, an extra focus on theory based research and empirical research in 3PL design/implementation and a greater emphasis given to qualitative methods and triangulation including longitudinal studies. This they suggest is important to get right in this emerging, growing and complex sector.

“It is timely to extend the methods employed and the issues addressed to deal with network phenomena and to progress more normative considerations”

Selviaridis and Spring (2007)

This has been reflected upon in the choice of research designs for this study. Indeed, after consideration it was concluded that given the novelty of the research area and the contextual complexities of the subject matter, a totally positivist stance would not be appropriate for this study. Isolating all the variables, given the wide range of potentially influencing factors and entities, was felt to be problematic, although there is an element of hypothesis testing in the case study in Phase Two, and therefore an alternative approach to a completely positivist stance was chosen. The adopted methodology is now discussed in the remainder of this chapter. Overall, the methods chosen represent a departure from the norm and add to the distinctiveness of the study.

In summary this research deploys a multi-method approach. After a preliminary **inductive** study presented in Chapter Four a **case study** research strategy is adopted

as this has the potential of providing the greatest depth of insights which is required in this novel, complex, dynamic and multi-faceted field of study – the logistics triad. Finally, the generalisability of the theoretical findings is explored. An in depth justification of these choices will be presented in the next section.

In conclusion, in using the framing criteria of Burgess et al (2006) a brief statement of description for the methodological approach can be summarised as follows:

*The research is conducted in three phases. Firstly, an **inductive** study is undertaken in the broad subject area of **inter-relationship management** involving **logistics provision**. This leads to the second phase which will take a **realist** paradigmatic stance based on a **case study** strategy with the purpose of developing theory and practice through **discovery and description**. Finally, a third phase is presented where an attempt to better understand the applicability of the findings to the wider logistics sector in the UK and beyond is undertaken.*

3.4 The Research Design

This sub-section aims to set out the overall research design and to describe in detail the research methods deployed in this thesis. The reasons why the chosen methodologies were decided upon are also explored and justified, including a brief discussion of alternatives that were considered but not deployed. In conclusion, it is argued that the research has been systematically conducted and the methods adopted were logical and appropriate to the research objectives and questions.

3.4.1 Overview of the Research Design

Before the specific research strategies and methods are described in detail and the reasons for their selection explained, the overall research design and approach is described in full. An accompanying schema to this discussion is provided to illustrate and clarify the exact sequence of research activity undertaken during the study (Figure 36).

The research is characterised by a mixed methodological approach. Saunders et al (2007) state that “not only is it perfectly possible to combine approaches (for example induction and deduction) within the same piece of research, but in our experience it is often advantageous to do so”. This sentiment is reflected in the adopted research design in this study which is framed in three phases.

Phase One is a preliminary inductive study. Its purpose is to expand knowledge of the process of business with a focus on the objective of understanding the influence of modern SCM on the conception and practice of outsourced logistics provision. It is undertaken through the combination of a Literature Review with an exploratory, empirical piece of research which assesses discourse from supply chain and logistics leaders in two sectors, steel manufacturing and groceries. Questions derived from this preliminary study are then put to an audience of logistics professionals and their responses help to externally validate the findings. This phase of the research channels down the research focus to centre upon the subject of inter-relationship management in logistics. From this, specific research questions concerning the management of the interfaces LSPs have with their customers in the logistics triad, are arrived at.

Phase Two is at the heart of the thesis and takes a more deductive approach. It explores the nature of inter-organisational relationship management in the provision of logistics with specific focus on the inter-relationships inherent in the logistics triad. A longitudinal case study in the steel sector over two years is chosen as the appropriate methodological strategy and setting. A range of qualitative and quantitative methods are deployed to support the triangulation of the findings to aid credibility and internal validity to the research.

Finally, in **Phase Three** the study focuses on the external validity of the case study research findings. Although a single case study can provide valuable insights and rich contextual detail its principal flaw is the inability to realise quantitative generalisation from it, as it only represents a sample of one. To partially compensate for this, the results of an interactive questionnaire are presented. This is derived from feedback provided by logistics professionals at a dissemination conference in February 2008, organised by the researcher, where the principal findings of the case study are responded to.

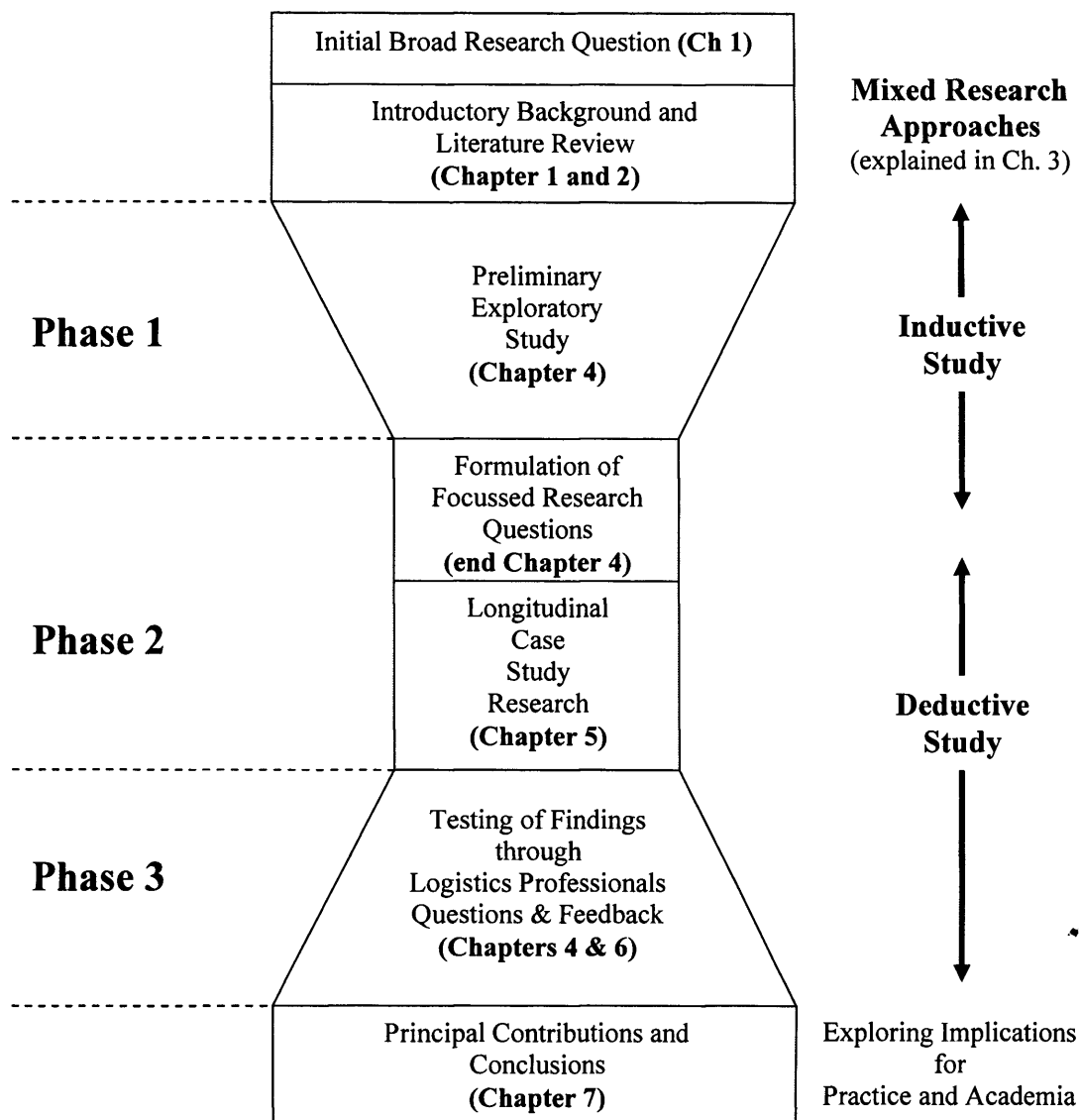


Figure 36: A Schema Summarising the Research Approach Taken in this Study

The next section takes each of the three phases in turn. It aims to explain in detail the research methods used and to justify why the chosen research strategies and methods were arrived at compared to the alternative approaches that were considered.

3.4.2 Phase One – The Preliminary Inductive Study

The section explores the methodological decisions that were connected to Phase One in the research. First the principal reasons for determining that an inductive piece of

research was appropriate for this phase are presented. Secondly, a detailed justification and description of the methodology tools chosen are discussed.

3.4.2.1 Justification of an Inductive Approach

Initially a broad research question was tabled to steer the research activity as follows.

“What is the influence of modern Supply Chain Management thinking in the way outsourced logistics provision is conceived and practiced?”

This was a broad initial question which was designed to set the foundations of the study. From the research deriving from this it was anticipated that more focussed research questions would emerge. A range of influential factors influenced the decision to link an inductive study with the literature review in addressing this question.

- **Contextual Richness of the Research Field**

As has been discussed it can be argued that research in business management is predominantly a social science rather than a natural science. Deduction had its origins in the natural sciences, but in social science it is much harder to defend an approach where there is a clear cause – effect link between variables. An understanding of the social context invariably needs to be developed.

A subject within the field of SCM such as relationship management in logistics would clearly appear to fall into this category. It is multi-faceted and in practice is impacted upon by many variables, external and internal to the firm which should be understood.

Moreover, the research sets out to channel focus onto the subject of logistics relationships from the contextual layers of logistics management and SCM, which in turn are discussed within the setting of the modern business era in which industrial sectors operate within. Again this lends itself to a preliminary inductive study so that a clearer “feeling” for the rich picture of contextual issues pertinent to each of the layers of the study is gathered.

- **The Wealth of Literature**

Creswell (1994) asserts that the “wealth of literature” is one of the key determinants of the research approach. If the literature is well developed and there is a strong consensus surrounding key definitions and knowledge then a more deductive approach would be more suitable. However, where the theoretical framework is more ambiguous and lacking in consensus then this would point to a more inductive design. SCM and logistics relationship management are arguably quite new research areas, as noted in the convergent/divergent debate presented earlier in this chapter, and although there has been a heightened interest in the subjects over recent years it can be argued that as research disciplines they are fairly immature – indeed as has been noted, Burgess et al (2006) determined that SCM was an “emerging discipline”. Thus again this supports a more inductive approach for the initial research phase.

- **Degree of Prior Knowledge**

Whilst an overview of the subject area was understood at the outset of the study, this was not at a sufficient level to frame a hypothesis at that stage. The depth of understanding of the topic, both from a practitioner and an academic level, needed to be further developed. This again points to a more inductive research stance being adopted.

- **Time**

Cresswell (1994) argues that time availability may also be an issue. It has been possible to develop a fairly rich qualitative picture of the logistics industry over the last few years through the research access afforded with business contacts and partners as a researcher, lecturer and PhD student.

- **Preferred Style**

A point which Hakim (2000) suggests is important, is the researcher’s own preference and ideas. Whilst it is clear that these need to be balanced against other considerations and thus should not always determine the research approach, this is an important factor. In this case the feeling of the researcher that it was important to generate a fairly sophisticated appreciation of the contextual issues involved both at the macro

and micro levels was a motivating factor in determining the initial inductive research approach.

- **The Nature of the Question**

When research questions contain the word “what” an exploratory study is justified (Ghuri and Gronhaug, 2002). The original research question was a “what” question and therefore lent itself to this kind of preliminary exploratory study. The objective, as stated, was to generate hypotheses or propositions, to be studied later in the research.

Two sectors were focussed upon: **the steel manufacturing sector** and **the grocery sector**. These two sectors were chosen because they provided quite different supply chain models and levels of supply chain maturity. The steel sector is relatively traditional in its application of SCM practices and thinking with a functional approach still clearly evident, although there is ambition to move towards becoming more supply chain orientated. By contrast the grocery sector has been transformed over the last three decades and is now considered to be one of the more advanced sectors in terms of SCM practice.

It should also be acknowledged that the choice of these two sectors for this study was influenced by their involvement in the on-going funded research programmes (ITeLS and McCLOSM) from which the research in this study had been developed (please see Preface).

3.4.2.2 The Inductive Study Methodology

Saunders et al (2007) state that a preliminary inductive study, such as the one undertaken at the outset of this research and presented in Chapter Four, must be purposeful, but can be conducted in a variety of ways – attachment to your chosen organisation, conducting informal discussions with people of experience in the field, analysing notes from meetings and presentations from experienced practitioner personnel and so on. All of these options in various degrees were available to the researcher and were therefore deployed in the exploratory study.

For the study a narrative presentation was principally used. This can be broadly defined as “an account of an experience that is told in a sequenced way..... that, taken together, are significant for the narrator and which convey meaning to a researcher” (Coffey and Atkinson, 1996). Saunders et al. (2007) add that a narrative account that, “clearly explains, for example, the social and organisational context within which a research participant operates, the nature of their engagement, the actions that they took, the consequences of these and events that followed may be analysed most effectively in its original form – this will retain the narrative flow of the account and avoid losing the significance of the social context within which these events occurred, or de-contextualising the data.”.

Quotes and anecdotes from experienced personnel from both the steel manufacturing and grocery sectors were collated under the categorising headings developed in the literature review – the four inter-organisational interfaces of the logistics triad and the four desired SCM qualities of predictability, velocity, reliability and reactivity. These quotes were gathered from a series of discourse events undertaken by the researcher where discussion related to the research objective and question had been undertaken. These events included: semi-structured interviews, meetings, presentations, informal discussions and attachments. A full list of the dates and events is provided in Appendix 1.

The companies involved were given letters for reasons of confidentiality. However, an anonymous list of the personnel and companies involved is given in Table 7. Most of the participating companies could be classified as large (a company employing more than 250 employees compared to less than 250 which is normally classified as a Small and Medium Sized organisation (Ghobadian and O'Regan, 2000). This is not untypical of the steel and grocery sectors where larger companies dominate the industries. Whilst there are many SMEs in the logistics industry these are principally single function providers, such as hauliers and are sub-contractors to the main LSP, which is the entity of principal focus of this study.

Company	Company Description	Customer or Provider of Logistics	Sector	Classifying Firm Size (SME/Large)
Company A	Major UK Based Grocery Retailer	Customer	Grocery	Large
Company B	Major US Based Grocery Retailer (operating in the UK)	Customer	Grocery	Large
Company C	Soft Drinks Manufacturer - UK	Customer	Grocery	Large
Company D	Multi-National Branded Goods Manufacturer	Customer	Grocery	Large
Company E	Multi-National Branded Goods Manufacturer	Customer	Grocery	Large
Company F	Major European Based Grocery Manufacturer	Customer	Grocery	Large
Company H	Leading European Based LSP	Provider	Logistics	Large
Company I	Leading UK Based LSP	Provider	Logistics	Large
Company J	Leading Logistics Services Company	Provider	Logistics	SME
Company K	Multi-National Branded Grocery Manufacturer	Customer	Grocery	Large
Company M	Leading UK Based LSP	Provider	Steel Logistics	Large
Company N	Multi-National LSP	Provider	Logistics	Large
Company O	Major Steel Producer	Customer	Steel	Large
Company P	Multi-National Steel Products Manufacturer	Customer	Steel	SME division (Large Parent Company)
Company R	Hot and Cold Rolling Mill	Customer	Steel	SME division (Large Parent Company)
Company T	Steel Product Supplier	Customer	Steel	Large

Table 7: A Classifying Summary of Participating Firms in the Inductive Study

To further assess the evidence provided an analysis of the narrative feedback was carried out. To achieve this, an indicative and subjective categorical description was given for the sector's SCM practice focussed upon the four nominated categories of desirable supply chain qualities (predictability, velocity, reliability and reactivity). The findings enabled a broad contrast to be presented between the two sectors SCM practice and the degree of emphasis lead actors in each sectors' supply chains placed on the desirable qualities. From this analysis the differing pressures placed upon the providers of logistics service provision could be better understood and explored.

It could be argued that there were limitations in this method in terms of validity on two important aspects. Firstly, in terms of how representative the contributing firms of their constituent sector populations and secondly in terms of any bias which may have been introduced by analysing only the selected quotes rather than full transcripts from the participants.

To counter these limitations it should be first noted that this study is only an exploratory study with the aim of informing and providing a more complete picture of the contextual issues surrounding logistics practice, using the steel and grocery industries as indicative sectors rather than any attempt to develop any theoretical contribution. Further, the conclusions obtained fitted closely with previous studies which indicated that the steel market was less developed from a supply chain perspective than the grocery sector.

To conclude this preliminary inductive study and to additionally confirm the more general applicability of the findings, questions derived from the research were presented to an audience of logistics professionals. A major conference was thus initiated and the organisation led by the author. It was held at the Belfry Hotel in the Midlands in the UK in February of 2008 with the purpose of disseminating to industry practitioners and fellow academics many of the findings from this research and also related points of learning from the wider research study this thesis is set within - McCLOSM (Mass Customised Collaborative Logistics for Sustainable Manufacture), an EPSRC programme at Cardiff University's Innovative Manufacturing Research Centre (CU-IMRC) – (please see Preface).

The principal findings from the exploratory study were presented by the researcher at the conference and then a number of questions were posed by him to the audience using an interactive device – the Interactive Audience Response System. This was commissioned by the researcher especially for the conference and was used to gauge the audiences opinions on the matters raised on a real time basis. Appendix 2 explains the keypad used by delegates.

Given that this is a relatively innovative use of technology in research sampling, there is little precedent in the academic literature of using this kind of tool for research purposes. However, a justification for its use can be made through the literature related to the sampling of populations.

The composition of the audience was clearly an important factor when assessing the relevance and validity of the responses. In total, just fewer than 100 delegates were attracted to the conference and a full list of their positions (where known) as well as the organisations they represent is given in Appendix 3. The methods of publicising clearly could introduce some bias into the audience sample: Here the policy was driven primarily by two issues; the need to communicate to as wide a prospective audience as possible and secondly to undertake this as efficiently as possible, as the budget was relatively small. Principal methods included the following:

- △ Distributing a leaflet to all delegates of a major European conference for the leaders connected to the Third Party Logistics industry;
- △ E-mail communication through numerous databases:
 - All previous attendees at conferences organised by the Logistics and Operations Management section at Cardiff Business School in the last four years
 - The alumni database for the Lean Enterprise Research Centre at Cardiff Business School
 - All members of the Logistics and Operations Management section at Cardiff Business School who were asked to pass on details to their contact base

- All partners involved in our research programme – McCLOSM – including representatives of the steel, grocery and general haulage sectors who were in turn asked to e-mail their contact lists.
- △ E-mail correspondence was also sent by the Chartered Institute of Logistics and Transport to all their members notifying them of the conference together with other events;
- △ E-mail correspondence to all members of the following associations was also arranged:
 - The Institute of Grocery Distribution (IGD)
 - Efficient Consumer Response (ECR – Europe)
 - The Midlands Urban Traffic Network
 - Various steel industry confederations
 - The Road Haulage Association
 - Freight Best Practice contact list.
- △ Details of the event was also publicised in Logistics Today and the Supply Chain Standard trade magazines.

No charge was asked for the event. Some biases clearly are exhibited in any such audience and hence an important caveat as to the validity of the feedback should be highlighted. Nevertheless, some authority and reliability should be taken from this research which provided an informative snapshot of views from professionals involved or connected to the modern logistics services industry.

Each delegate was given an interactive key pad (Appendix 2) at the start of each conference session and was asked a number of initial questions with the purpose of familiarising them with the technology and to ascertain their job role. In particular it was ascertained at the start of each session how many responders were actively involved in industrial practice and from this section of the audience how many were involved in logistics provision and how many were primarily customers of logistics providers. (It should be noted that the exact composition of the audience did change slightly for each session).

The method of questioning was as follows. For each question a slide had been prepared and this was displayed at the same time as the question was read out on a

giant projection screen. Multiple choices were given as possible answers for each question and again displayed on the giant projection screen. A brief time period was then given to ensure all delegates understood the question. After this delegates were given 10 seconds to enter their response by simply pressing the button that corresponded to their answer. After this 10 second period was over the combined responses were displayed back to the audience in almost real time in the form of bar and pie charts. The system in effect allowed instant consultation with everyone who attended the conference event at any stage.

The system was very good at gathering the audience's opinions and thus allowed for propositions to be put to the delegates and their responses gleaned from them in an inter-active and interesting manner with their collective responses being displayed back to them. Importantly, in terms of ethics and confidentiality no attempt was made to attribute names to any of the hand held terminals; and, other than notifying their broad area of interest related to logistics provision there was no method of following up who had individually responded to any question. This level of anonymity was very important and thus the confidentiality of the system was emphasised at the outset of the process so that delegates felt able to respond as they individually felt to each question. Without peer pressure the quality of responses was high.

Before the session the composition of the audience was ascertained in terms of the sector which best described where the delegates were from; industry, consultancy, government, academia, or another occupational domain. Then, if they came from industry these delegates were asked whether they were providers or customers of logistics or connected to logistics in another way.

Bias existing in the audience was restricted as much as possible by the conference being an open invitation and free to any person interested in the research findings. However, inevitably an element of bias is clearly inherent and hence whilst some weight in terms of generalisation can be given to the results, some degree of limitations to the findings has to be acknowledged.

For example, when studying the delegate lists it is clear that a number of delegates came from the steel, grocery and general haulage sectors which were the main focus

areas of the research and hence where many interested parties were derived from. A further source of bias could have been created in that the questions related to each presentation and were posed directly after each 40 minute presentation was given; firstly of the inductive study and secondly the results of the case study written up by the author and presented jointly with an industrial partner involved in the triad. Therefore, whilst the questions were designed to glean the audience's responses to the findings the audience could also have been influenced by the content of the presentation or the way it was presented and this should be noted as an item of caution when interpreting the response level.

Therefore some caution needs to be noted in inferring too much from the results given by the delegates. Nevertheless, the responses do provide interesting insights into the kind of response which may be felt by the wider population, and, providing the limitations of the audience sample are noted some meaningful conclusions could be drawn.

The questions asked were developed with reference principally to the findings in the preliminary inductive study, but also were informed by the Literature Review. Initial versions of the questions were checked with colleagues both informally and formally and changed slightly before being deployed. A full list of the final versions of the questions for Phase Three is available on Appendix 4. Each question is also set out in Table 8 with the relevant underlying literature source registered against it.

The inductive phase, together with the Literature Review in Chapter Two, do not stand alone, but are informed by each other in a trans-disciplinary manner reflected upon at the start of this chapter. As the research focus is refined, a fuller contextualising picture is developed based on the findings of both chapters. To this end it is possible to ensure that the research questions are based in social reality as well as fitting with academic research.

<p style="text-align: center;">Question Tabled</p>	<p style="text-align: center;">Evidence of Relevant Underlying Research Introduced in the Literature Review and Findings from the Preliminary Study (Page indicated after each reference)</p>
<p>In your experience of logistics provision in the last few years do you feel that the type of relationship which exists between the logistics provider and the shipper is aligned to the overall supply chain strategy?</p>	<p>This question probes into the findings from Bask (2001) who postulated that there ideally should be an alignment between the relationship type and the complexity of service. Alignment of relationship with the overall supply chain strategy is a concept that many authors have proposed – E.g. Lambert et al, 1998, p.39, Evans et al, 2007, p. 55, Child (1972)– p.128, Giunipero et al, (2006) and Halldorsson et al, (2007)</p>
<p>In your experience of logistics provision in the last few years do you feel logistics service providers have shown more / less interest in exploring initiatives which involve horizontal collaboration?</p>	<p>The literature review and the preliminary inductive study (notably in the grocery sector) identified the issue that horizontal coordination or collaboration is becoming a greater feature of contemporary logistics practice. For example, Mason et al, 2007 – p. 82 notes that “leveraging opportunities from the wider industrial network, not just the supply chain network” has become more popular in LSPs business models. This question probes into this finding.</p>
<p>In your experience of logistics provision in the last few years do you feel shippers have shown more / less interest in exploring initiatives which involve horizontal collaboration in logistics provision?</p>	<p>Building from the issue raised above this question probes into whether there is a difference in perspective on the issue of horizontal initiatives between the LSP and their customers, the shippers.</p>

<p>In your experience of logistics provision in the last few years how would you compare the strength of the relationship the shipper has with its logistics provider compared to the product buyer – seller relationship?</p>	<p>The importance of relationship quality has been emphasised as an important quality if a supply chain orientation (Mentzer et al, 2000) is to be adopted. The question probed into the two principal inter-organisational relationships in the logistics triad, the core driving relationship between the buyer and the seller and the support relationship between the shipper and the LSP and asked about their relative strengths.</p>
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Table 8: The Questions Given to the Audience of Logistics Professionals at the Conference held at the Belfry Hotel in the Midlands in the UK on 27th February 2008

The preliminary inductive study as well as enabling the research to be better contextualised also helped to further channel the research focus. From this exploratory study the principal objective of the study centring on a deeper understanding of how the logistics triad could be organised and managed to support mutual gains for all participants was arrived at.

3.4.3 Phase Two

The section explores the methodological decisions that were connected this time to Phase Two in the research. This phase is at the heart of the research and featured a case study as the chosen research methodological strategy. The principal reasons for determining that a case study approach was the most appropriate for this phase is presented followed by a detailed justification and description of the methodology tools that were deployed.

3.4.3.1 Justifying the Case Study Approach

Yin (2003) suggests that case studies are well suited when “why” and “how” questions need to be answered. The two principal research questions were both “how” questions and thus pointed towards a case study research strategy being the most appropriate. The research questions were:

△ How suitable is the logistics triad as a unit of analysis in supporting the role of modern outsourced logistics within the setting and goals of supply chain management?

△ How should a logistics triad be managed so that the inherent opportunities are realised and the barriers overcome?

Case studies can be deployed in a variety of research designs and their applicability to a range of research inquiries make case studies very attractive to researchers of organisations. Yin (2003) notes that the case study is the preferred approach when, “the researcher has little control over events and when the focus is on a current phenomenon in a real life context”. Eisenhardt (1989b) goes on to note that case studies are well suited to new research where the early stages of research are being undertaken. Although research in relationship management in logistics has been a maturing topic or research especially over the last two decades, the logistics triad itself as a potential unit of appraisal is relatively under-developed. As has been highlighted in the Literature Review, one of the attractions of this area of research is the degree of paucity of research in the topic area which has previously largely been confined to conceptual studies and findings. In summary the important aspects which also pointed towards a case study being the best research strategy were:

- △ the novel aspect of the research - although there are many examples of case studies of the inter-organisational dyad a case study of a logistics triad had not previously been undertaken;
- △ the perceived research gap in this area where only scant empirical work had previously been carried out;
- △ the nature of the issues, which are highly complex and contain a number of possible variables, and
- △ the dynamic nature of the logistics triad concept which links across organisational boundaries and makes it best suited to being studied in a real-life context.

The selection of a case study as the research strategy can also be explained by reviewing the disadvantages of some of the alternative research strategies which were considered.

For instance an ethnographic approach was considered but was rejected on two points. Firstly, there was a danger that in conducting the research an ethnographic study, involving the immersion of the researcher in the businesses of focus, would have led to the role of the researcher being too influential potentially invalidating the findings. Secondly, the time involved in conducting this kind of research was problematic as the research had to be carried out on top of the researcher's basic job.

Another alternative was to conduct a survey. This was rejected principally as it was not as novel as the case study approach – Gentry (1996) had previously conducted a survey focusing on the logistics triad. There was also concern about the level of data which would have been collected by a survey which would not have been as wide-ranging as data collected in a case study. Finally, response rates were also a concern especially as the ideal would be to obtain data from each actor in each triad.

Therefore, the case study was selected as the most appropriate research strategy for **Phase Two** predominantly because the study was exploratory and the subject was a dynamic phenomenon with links across organisational boundaries, which can be best studied in a real life context (Yin, 2003). This argument is supported by Dubois and Araujo (2004) who state that case studies are very suitable for research in which interactions and relationships form the core units of analysis and Visser and Ploos van Amstel (2008) who add “the case study enables the researcher to capture the potentially crucial contextual information and facilitates a deeper understanding of relationships”.

The next section explores the main features of a case study approach and the type of case study which was selected.

3.4.3.2 The Case Study Approach

The case study approach chosen is an **embedded single case**. Yin (2003) distinguishes case study strategies on two dimensions: firstly, whether they are based

on a single case or comparison of multiple cases and secondly on whether they are “holistic” or “embedded”. On the first dimension, single cases, Saunders et al (2007) argue that they may be more appropriate where the case is “typical or because it provides you with an opportunity to observe and analyse a phenomenon that few have considered before”. The typicality of the case will be assessed in the next section when the representativeness of the case and its generalisability potential are discussed. In short, care must be taken not to over generalise the findings to the wider population. In terms of the second point made by Saunders et al (2007) this is an embryonic area of research and no previous empirical case study on the phenomenon of the logistics triad has been found to have been undertaken.

Taking Yin’s (2003) second dimension if the research considers an organisation as a whole then a holistic study would be appropriate. This would particularly apply when the researcher is employed by that organisation. An embedded case study is defined as researching, “a number of logical sub-units within the organisation” (Saunders et al, 2007) and is an accurate summary of this study. A summary of the positioning of the research within Yin’s typology of case studies is shown in Figure 37.

Multiple Case Studies		
Single Case Study	<i>Position of this research study</i>	
	Embedded Case Study	Holistic Case Study

Figure 37: Position of the Case Study Research Strategy adopted in this Research Study within Yin’s (2003) typology of Case Study Research Approaches

The case study is a research strategy. It is not a research methodology. The methodologies deployed in the case study element of the research were various and

were derived from an umbrella methodological approach derived from Quick Scan (Naim et al., 2002).

The Quick Scan method is a supply chain orientated business diagnostic which has been developed by the Logistics System Dynamics Group at Cardiff University over a number of years. Over fifty Quick Scans have been carried out primarily on individual companies or on their dyadic relationships with their customers and/or suppliers in a variety of settings (e.g. in the automotive sector – see Towill et al, 2002). In principle it sets out through a triangulated method to assess the capabilities, competencies and weaknesses of an organisation or supply chain through a well structured procedure based on four stages: understand – document – simplify – optimise (USDO) (Watson, 1994). The interpretation of these four stages adopted in this research is detailed below.

- △ **Understand** – develop a vision of market, business strategy, business processes and business capabilities;
- △ **Document** – capture a record of understanding through a range of triangulated techniques including business process mapping, data analysis, feedback to questionnaires and interviews and so on;
- △ **Simplify** – distil the understanding to the critical components in the business diagnostic which if focussed upon and improved through forward process engineering could lead to the greatest possible return;
- △ **Optimise** – execute the forward process engineering design and ensure changes made are fully integrated into legacy systems and thinking

One of the main advantages of the Quick Scan method is that it is based on the deployment of a range of quantitative and qualitative research tools and thus allows a greater degree of depth and rigour to be gleaned compared to the information obtained from surveys. This use of triangulation methods is very useful in being able to attribute causes to effects, a key issue in theory building research (Gill and Johnson, 1997), which will be reflected in the validity discussion in the next section. A brief description of the research tools deployed on the Quick Scan is set out below.

Interviews: A number of applicable personnel from each of the members of the logistics triad were interviewed through the longitudinal case study. These included operators and managers. These interviews conducted face to face and over the telephone were semi-structured in nature and aimed at:

- Δ validating any performance data obtained;
- Δ seeking out explanations for changes in performance;
- Δ developing a richer understanding of the contextual issues and influencing factors

At the nine month review a more formal collective interview/meeting was chaired by this researcher and included a senior representative from each of the triad entities. They were:

- Δ The Managing Director of the Logistics Service Provider and his Senior Manager for Logistics Service Provision in the Division of focus.
- Δ The Managing Director of the Division of the Customer Company
- Δ A Senior Supply Chain Manager of the Supplier Company

Again a semi-structured format was followed.

Further semi-structured interviews were also carried out at the end of the two year period by the researcher with key personnel from each of the three participating companies. Personnel had moved on so it was hard to obtain perfect continuity but a number of participants who had been promoted in the intervening period also contributed to the earlier stages of the research. For each organisation at least one of the interviewees was also involved in earlier stages of the research as follows:

- Δ The new Managing Director of the Logistics Service Provider (who replaced his predecessor who had retired had previously been the Senior Manager of the Division of Focus
- Δ The new Managing Director of the Division of the customer had previously been the site manager and consequently had been involved in the research from the outset

△ The Senior Supply Chain Manager of the supplying company was still in post

As well as interviews two further methods of data collection were used. Firstly archive data and information about the actual delivery performance and delivery data was obtained and assessed. From this actual progressive delivery on time figures for set periods were calculated. An example of the new performance measures and delivery data is appended in Appendix 6 and the associated graphs and visual displays of data is shown in Appendix 7. Delivery data after the commencement of the new aligned measurement system also contained information on reasons why deliveries had been missed and which party was at fault.

Secondly, an on-going survey questionnaire was carried out through the research of the participating companies' personnel. The questionnaire was developed to ascertain the level of collaboration present in each of the dyadic relationships across the three logistics triad's dyadic inter-relationships. This was carried out at the outset of the case study and after 24 months with the managers and directors of the triad organisations. The five principal questions were arrived at through a multi-stage process. First an initial draft of the questions was produced with reference to relevant Literature Review. Trial runs of the questions were tested with colleagues and on studies with other companies which had looked at the dyad rather than the triad. The responses were scored on a 5-point Likert scale with 5 = highest level of collaboration and 1 = lowest or loose collaboration. The mean average was calculated for each group of participants and this was converted into a categorising rating of Low (below 2.0), Medium (2.1- 3.0) or High (3.1 and above).

The questions used and the supporting references used to provide content and construct validity are given below:

1. To what extent is the relationship with Company X adversarial (low) or managed through partnering (high)?

This question relates to Table 2 from Chapter Two developed from Spekman et al. (1998) and Skjøtt-Larsen et al (2003)

2. To what extent does Company X have common visibility of supply chain processes?

This question relates to a core component of SCM – the sharing of information between inter-relating firms in the supply chain. “The idea behind supply chain management is to bring together parties beyond the boundary of the firm, in the case of logistics, the supplier, the customer and the third party providers to share the information required to make the channel more efficient and competitive” (Ellram, 1991a)

3. Is there a common alignment of supply chain performance measures between yourselves and Company X?

This question relates to Caplice and Sheffi’s (1994) assertion that effective logistics measurement should “link operations to corporate goals”. That is, they should be hierarchical.

4. To what extent is there a cross integration of expertise between yourselves and Company X?

This question relates to supply chain integration which was muted as a critical component of SCM by authors such as Stevens (1989 and 1990)

5. To what extent does trust exist between yourselves and Company X?

This question relates to the vulnerability inter-relating firms have to one another as they “relax controls, become more accepting of influence, and share information.....if vulnerability is rewarded, (i.e. company performs competently and maintains confidentiality) trust is established between the parties” (Zand, 1972).

As noted earlier, the use of a range of methodological techniques helped to triangulate the results obtained from the study. The next section explains the background to this internal validation as well as going on to look at external validation which can be an issue when conducting a single case study.

3.4.3.3 The Validity of Research from the Case Study

The discussion of the methodology techniques selected focuses now on the validity of the findings stemming from the case study research. Gill and Johnson (2002) distil this general issue down into three criteria:

- Δ **“Internal Validity:** Whether or not what is determined as the cause(s) or stimuli actually produce what have been interpreted as the effects or responses;
- Δ **External Validity:** The extent to which any research findings can be generalised or extrapolated beyond the immediate research sample or setting in which the research took place – within this two sub-divisions can be created;
 - **Population Validity:** the extent to which it is possible to generalise from the sample of people involved in the research to a wider population and
 - **Ecological Validity:** the extent to which it is possible to generalise from the social context in which the research has taken place and data thereby gathered, to other contexts and settings. This is also related to how artificial or atypical the research setting is relative to “natural” contexts typical of normal, everyday life.
- Δ **Reliability:** The degree of consistency obtained of results obtained in the research. It should be possible for another researcher to replicate the original research using the same subjects and the same research design under the same conditions.” (Gill and Johnson, 2002)

Each criterion can be reviewed in turn in light of the case study strategy.

3.4.3.3.1 Internal Validity

Internal validity is one of the most critical issues in theory-building research. Internal validity can be broken down into two components which are relevant for consideration in this research: content validity, and construct validity (Blumberg et al, 2005). These components are particularly important when developing the questionnaire which, in this research, probed into the state of relations for each triad member with each of the other two triad members as well as the state of internal collaboration between internal functions.

Content validity is about the quality of the questions asked in the questionnaire, and whether “they provide adequate coverage of the investigative questions” (Saunders et al, 2007). **Construct validity** “refers to the extent to which your measurement questions actually measure the presence of those constructs they seek to measure” (Saunders et al, 2007). Clearly, there is an element of judgement here. As stated earlier the questions were derived from the Literature Review and each reflected a key issue that emerged as important in business inter-relations namely, a partnering rather than an adversarial relationship, the importance of visibility of shared information, aligned performance measures, integration between partners in the supply chain, and the development and maintenance of trusting relations in inter-relationships in the supply chain.

Beyond this however, is the core issue in internal validity. As Saunders et al (2007) conclude “validity is concerned with whether the findings are really about what they appear to be about”. In short is there a causal relationship between the two variables? In this case study was the change in behaviour and performance of the logistics triad entity as observed over two years (the dependent variable) due to the introduction of the logistics triad concept (the independent variable), or was it to do with other outside factors (extraneous variables), or was it to do with a combination of factors including the introduction of the logistics triad concept?

To reach the conclusion that the dependent variable was caused by the independent variable the Quick Scan methodology discussed above which emphasises the importance of triangulating the research findings was important. From the research tools deployed, interviews, questionnaires and archive data, three types of information were collected through the case study: performance data (records of actors results) were combined with opinion data (records of how respondents feel) and behaviour data (records of how respondents act), which were based on Dillman’s (2000) classifications of data variables. As a result, hard quantifiable results were supported and endorsed by qualitative findings permitting more confident conclusions to be drawn about the link between the dependent and independent variables. The validity analysis of the findings is presented in Chapter Six.

3.4.3.3.2 Facilitating the Longitudinal Case Study

Linked to the discussion on validity, the facilitating role played in researching the logistics triad experiment should be reflected upon. As stated in earlier discussions, there was considerable motivation which existed in representatives of all three logistics triad players in the project and associated initiatives. However, although every attempt was made to ensure the research was as passive and as objective as possible, which included the researcher being never involved in the actual operation, inevitably the role contained an element of subjectivity and was partially instrumental in setting up and steering the evolution of the triad.

In summary, the actions taken in the research role were as follows:

- bringing together the three parties;
- motivating all three parties to be involved to see the mutual benefits in pursuing the triad experiment;
- helping to pinpoint the underlying issues and problems;
- sponsoring solutions and supporting ideas put forward, and providing links to academic theory and knowledge in this area;
- chairing review meetings and facilitating related discussions;
- collecting and observing the long term results

It should also be noted that in order to restrict the level of “leadership” that the research role introduced into the research design the idea that follow up studies were to be made to check on progress was deliberately played down at each stage. Hence the reasons for persevering with the new measurement systems and more aligned operating practices were predominantly driven by the participating parties own self-interest and self-motivation.

Nevertheless, in summary, although the logistics triad concept was owned by the three parties involved, by acting as a facilitation agent, the addition of a research element into the triad inevitably made this case unique. Again this needs to be carefully considered in any attempt to generalise the findings which will be discussed in the next section on external validity. This issue represents a clear limitation of the research findings which will be discussed the final concluding chapter.

3.4.3.3.3 External Validity

Generalisability is about whether research findings are equally applicable to other research settings or populations. In choosing the particular triad for the research there is no suggestion that this was based on any consideration of the sample being representative of the wider population. It would also be difficult to justify generalisation from the findings of this study in a statistical sense.

Clearly this lack of representation and generalisability can be viewed as a weakness and detract from adopting a case study approach. However, advocates provide responses to these challenges and indeed “turn these alleged weaknesses to virtues” (Allan and Skinner, 1991).

What is meant by **representativeness** and **generalisability**? Allan and Skinner (1991) give these two definitions:

- Δ “**Representativeness** has come to mean typicality – i.e. a sample fully reflective of the population from which it is drawn”;
- Δ “**Generalisability** is the ability to extrapolate with statistical confidence from the sample to the population from which it was drawn”

Each weakness and its counter argument will be considered in turn.

3.4.3.3.3.1 Representativeness

Allan and Skinner (1991) point out that a case study treats representativeness more on the lines of “qualitative style” rather than quantitative sampling. They cite Hakim (1987) who suggests that, “a case study adopted is a selected example of a social entity”. In other words, “it is more important to treat representativeness in terms of qualitative logic of selecting the case study rather than quantitative logic of sampling from a population” (Allan and Skinner, 1991). To this end Mitchell (1983) characterises the case study approach in terms of, “a detailed examination of an event or a series of related events which the analyst believes exhibits (or exhibit) the operation of some identified theoretical principle”. Thus a case study may be “atypical, but correspondingly possess greater explanatory power” (Mitchell, 1983).

In this case study of a logistics triad in the steel sector, in many ways it is not untypical of outsourced logistics operations. For instance, if it is related back to the findings of the inductive study in Chapter Four it can be found that many of the aspects which were noted as characteristics of logistics provision in the steel sector are observable here. For instance, a range of these commonalities are listed below:

- Δ the logistics contract is outsourced – this is common in the steel industry;
- Δ the seller of steel is responsible for managing the logistics contract – again common practice in the steel sector;
- Δ the method of placing orders for steel is in keeping with practice common across the steel sector;
- Δ the nature of steel logistics transportation for steel coil by road for frequent but relatively small shipments is fairly standard across the sector;
- Δ the issues of performance measurement concentrating on functional rather than process measurement is in keeping with what has been observed in the steel industry (see Potter et al, 2004)

To better understand the logistics provider population that this case study is most representative of, two of the classifications of LSP types introduced in the Literature Review can be considered.

First the case study can be positioned against Berglund et al's (1999) typology of the different types of provider which combines the range of logistics services provided with the degree of management argued by Leahy et al. (1995) and Skjøtt-Larsen et al (2007). This positioning of the Case Study is shown on Figure 38, (which was originally shown in the Literature Review), and accommodates Berglund et al's (1999) classification of four possible LSP models - Traditional LSPs - Asset Based LSPs - Network Based LSPs - Skill Based LSPs.

Physical Services

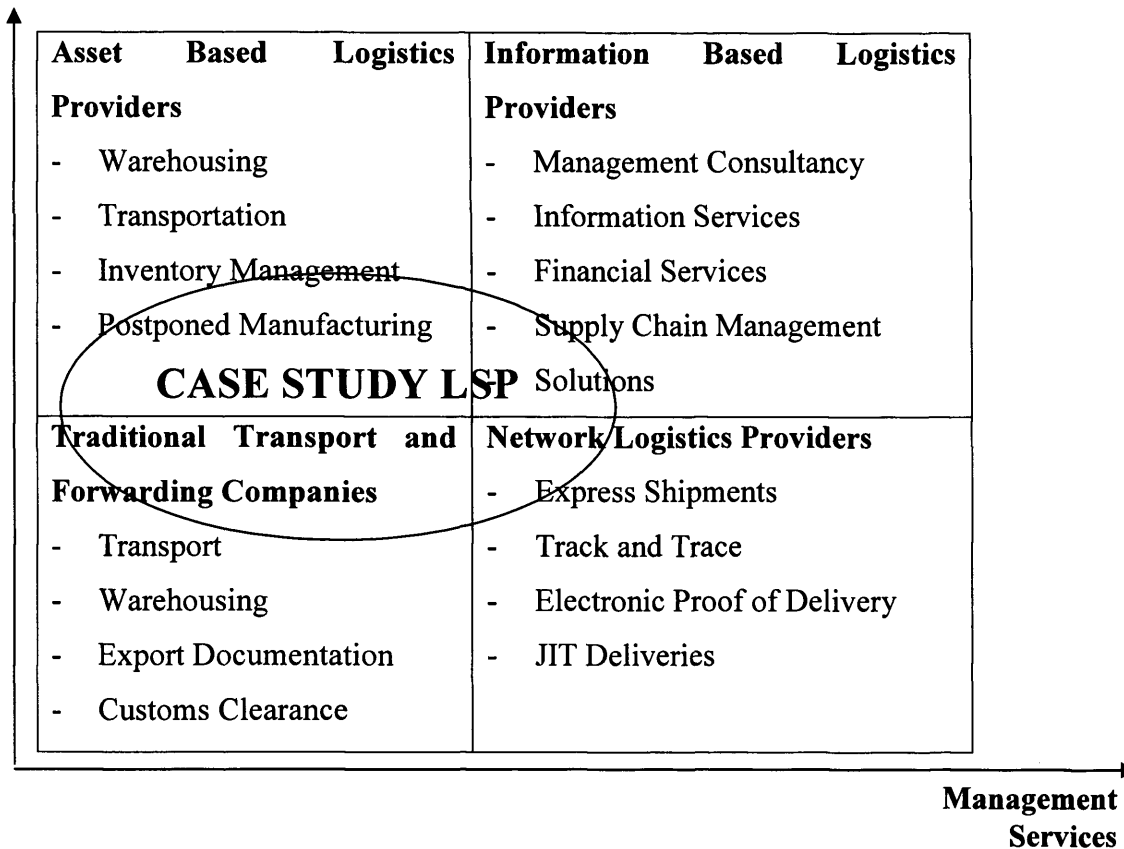


Figure 38: Typology of LSPs (Berglund et al 1999) showing the positioning of the Case Study in this research thesis

The LSP in the case study has been developed from a traditional LSP. They own assets such as trucks and warehouses and have extended their core business to offer wider logistics services, although not inventory management. Although they cannot be classified as a Network Based LSP, they have developed a capability to manage their assets across a regional network to better optimise asset utilisation and have adopted some of the competencies developed by this category of LSP such as vehicle/delivery tracking. The skill based category is akin to the non-asset based LSP in Sheffi's (1990) classification which is clearly not applicable to this case study example, although the LSP does manage some of the information flows pertinent to logistics.

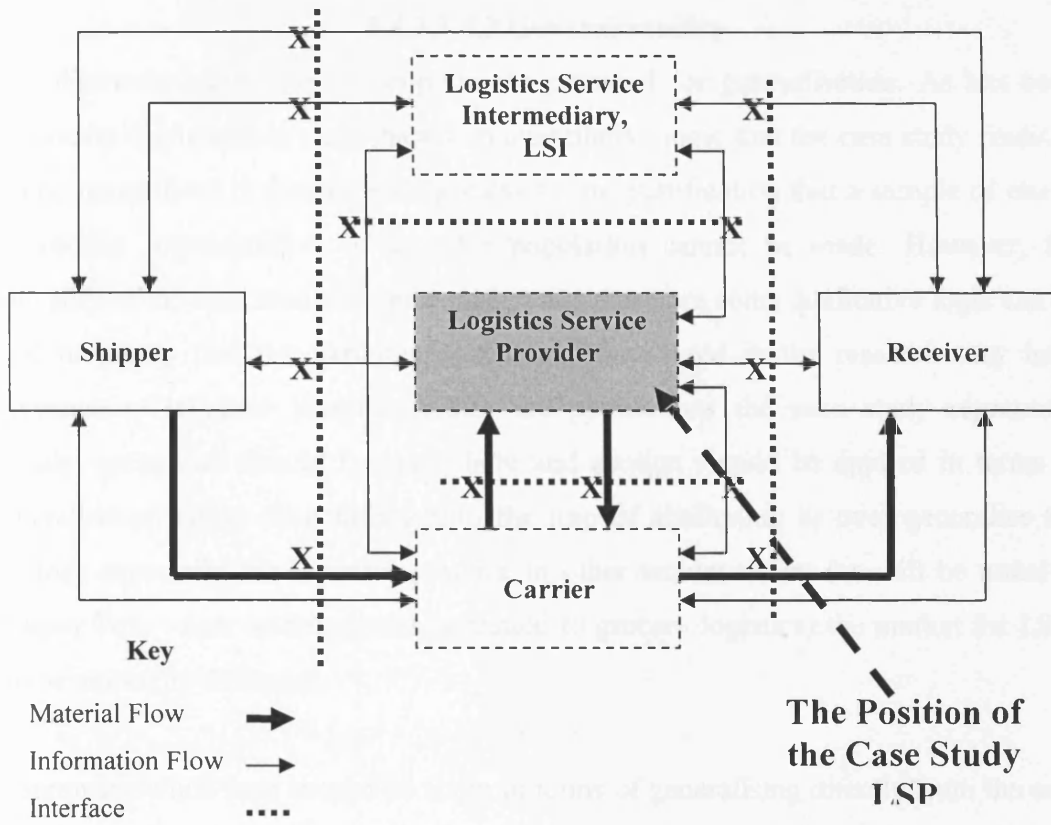


Figure 39: The Positioning of the Case Study LSP against the Three Stage Collaborative Logistics Management Model Developed by Stefansson (2004).

The second classification of LSP types introduced in the Literature Review which can be used to position the Case Study in the wider LSP population, is the model proposed by Stefansson (2004). The positioning of the Case Study is shown in Figure 39. Stefansson (2006) reflects that a more complex structure is often exhibited in logistics service provision. As well as the basic Carriers, LSPs and what he terms as Logistics Service Intermediaries (essentially non-asset based players) also need to be considered as part of the logistics services entity. Each element, he argues, has a different role to play and services to provide, and each has potentially different links to the other two members of the triad in terms of material and information flow. The LSP in the case study fits exactly with this description. It also outsources operations to sub-contracted logistics players (carriers – in Stefansson’s model), to help manage the peaks and troughs (although this does not normally occur on this specific case study which is more self contained). Therefore the case study can be positioned in the centre of this model.

3.4.3.3.2 Generalisability

This discussion now helps to explain the potential for generalisation. As has been previously discussed, to claim based on quantitative logic that the case study findings can be generalised is fundamentally flawed – the justification that a sample of one is statistically representative of a wider population cannot be made. However, the typicality of the case study can be justified and therefore some qualitative logic can be used to justify that the exploratory findings uncovered in the research may have relevance to logistics practice within the populations the case study represents. Clearly, great care should be taken here and caution should be applied in terms of generalisation rather than falling into the trap of attempting to over generalise the findings especially for logistics practice in other sectors where (as will be noted in Chapter Four when steel logistics is related to grocery logistics) the market for LSPs can be markedly different.

In summary while care should be taken in terms of generalising directly from the case study, the case study itself is an instrumental piece of research in that it provides an in depth exploratory setting for many of the intrinsic issues common to many logistics triads to be examined in some depth over a longitudinal time period. So whilst this is a unique case the revelations and the learning from the research are in many ways representative of the “social entity” being studied, that is other logistics triads, and therefore it can be claimed that the study has great “explanatory power”.

Yin (2003) endorses these points. He notes, “although it (a case study) is not a representative sample, the researcher should be more interested in its analytical generalisability – the ability to be able to expand or generalise on theories, rather than its statistically generalisability of the total sample”. So it is the ability to be able to use the analysis of our findings and to relate these to the wider population of logistics triads in the steel sector and beyond in other sectors and settings that will determine the value of the research.

Finally, it should be noted that the issue of generalisability is not just an issue restricted to the case study approach. It is always an issue when any sample is used in research. Bryman (1988) notes that any sample that has been strategically chosen as a sample from a total population suffers from this generalisability problem to some

degree. However, here it is important again to underline at the conclusion of this section that statistical generalisation has not been the aim of the research – analytical generalisation is the goal.

To conclude, whilst quantitative generalisation cannot be considered, it can be argued that there is some potential for generalisation due to “qualitative logic” to the wider populations of LSP operating in the steel sector and potentially in other sectors. However, despite these points indicating that the case study chosen is arguably typical of certain types of logistics service provision, in many ways it would be incorrect to claim that empirical generalisation could be confidently generated purely from the study. In their very nature many aspects of logistics provision even across one sector such as steel, are contingent to their own environment (as are the inter-relations which exist in every logistics triad). The aim is therefore not to produce a theory which is generalisable to all populations but instead to simply explain what is going on in this particular research setting.

This is where the testing of the findings in **Phase Three** for its applicability and robustness to a wider population through an interactive session at a major dissemination conference now explained below, is so beneficial to the overall research message.

In summary the case study as a research strategy has many advantages which this research demonstrates. It allows for an in depth study and has allowed the testing of theoretical propositions in a real setting. This is useful in this study as the area of research centring on the logistics triad is fairly embryonic where most of the research activity thus far has been conceptual and thus there was a need for theories to receive some real empirical support. The limitations of this approach are well known and have been recognised and challenged.

3.4.3.4 Case Study Method - Conclusions

Phase Two is at the heart of the thesis. The decision to select a case study as the preferred research strategy, as opposed to alternatives, has been explored and the specific methodological techniques have been detailed. Finally, discussions around

the internal validity, representativeness and generalisability of the research have been discussed and the theoretical legitimacy of the research along with the perceived limitations of the methodology adopted has been presented.

3.4.4 Phase Three

The discussions on generalisability feed well into the founding reasons for conducting **Phase Three** of the research which is presented in the Analysis Chapter (Chapter Six).

As has been highlighted, there are detractors who challenge the weaknesses of the case study approach in its fundamental flaw in terms of research credibility. It is argued that a case study is not quantitatively representative of its total population and hence suffers from its inability to be able to form the basis for empirical generalisations to be developed. Despite the defence that analytical generalisations can be drawn from them (Ellram, 1996), any further research that can be undertaken to help in better claim an element of generalisability, even with limitations can be considered as an advance. This is the objective behind Phase Three of the research where an attempt to highlight the relevance of the research to the wider population is made.

To address this criticism and to partially counter the criticism noted above of the case study approach the results of the research were presented in a second presentation to an audience of logistics professionals at a major dissemination conference. The interactive feedback provided by the delegates to specific questions derived from the research findings helped in the conclusion that the issues raised in the research had wider merit and significance to the wider business logistics population.

Alternative methods could have been deployed here for this purpose, such as further single or multiple case studies or even a questionnaire survey. However, each has its weaknesses which ruled out their adoption.

Further case studies as well as being time-consuming would not necessarily have achieved the objective of supporting the generalising of the findings as by their very

nature, as discussed above, they suffer from being able to be quantitatively generalised to the wider population.

Questionnaires suffer from a recurring issue of poor response rates (Saunders et al, 2007) and also would have been challenging to conduct as survey research would ideally have required feedback across all three constituent members of each triad (Gentry, 1996); although this would not have been impossible to achieve, given the findings attained suggesting a lack of joined up communication across logistics triads, any expectation of identifying complete triads willing to feedback to a questionnaire appeared unlikely. This was experienced directly in the grocery sector when exploratory discussions revealed that industry trade bodies such as ECR (Efficient Consumer Response) or the IGD (Institute of Grocery Distribution), whose focus is on bringing primary supply chain partners together, do not include LSPs in their membership.

Thus it was determined that the most applicable method was to gauge the reaction from a range of logistics professionals more directly. First, delegates at a major European conference, the EyeForTransport organised forum for the Third Party Logistics Industry in November 2007, were written to inviting them to participate in a follow up study. Unfortunately the response rate was too small for this method to be progressed. Instead, the researcher instigated and led the organisation of an alternative conference where the results of the research could be disseminated and feedback gathered.

The organisation of the conference held at the Belfry Hotel in the Midlands in the UK in February of 2008 has been presented earlier in chapter 3.4.2. A similar survey of the delegates using the same method was used for assessing the generalisability of the findings from the preliminary inductive study earlier in the morning at the same conference.

The principal findings from the logistics triad case study were presented by the researcher at the conference during the second morning session with a senior manager from one of the triad companies. Then a number of questions were posed by the researcher to the audience using the interactive device – the Audience Response

System which is shown in Appendix 2. Only those who stated they came from industry are reported in this thesis and it should be noted that the composition of the audience which was checked at the start of each sessions was slightly different from the earlier morning session.

The questions asked were developed with reference principally to the findings in the case study, but also were obviously informed by the Literature Review and the Preliminary Inductive Study reported in Chapter Four. Table 9 summarises the questions and indicates the relevant contextual literature background. Initial versions of the questions were checked and trialled with colleagues both informally and formally resulting in minor amendments before being presented at the conference on a PowerPoint presentation. A full list of the final versions of the questions for Phase Three is available on Appendix 5.

The method of questioning was exactly the same as had been carried out in the earlier version of this described in 3.4.2 (Phase One of the research) as follows. For each question a slide had been prepared and this was displayed at the same time as the question was read out on a giant projection screen. Multiple choices were given as possible answers for each question and again displayed on the giant projection screen. A brief time period was then given to ensure all delegates understood the question. After this delegates were given 10 seconds to enter their response by simply pressing the button that corresponded to their answer. After this 10 second period was over the combined responses were displayed back to the audience in almost real time in the form of bar and pie charts. The system in effect allowed instant consultation with everyone who attended the conference event at any stage.

<p style="text-align: center;">Question Tabled</p>	<p style="text-align: center;">Evidence of Relevant Underlying Research Introduced in the Literature Review and Findings from the Case study (Page indicated after each reference)</p>
<p>In your experience of logistics provision in the last few years how often do the product supplier, the product customer and the lead logistics provider (the logistics triad members) formally aim to align objectives and working practices?</p>	<p>The alignment of structures, inter-organisational relationships measures and systems in support of the shared goal of better optimising supply chain performance has been highlighted by many studies: for example Child (1972) – p.128, Giunipero et al, (2006) – p.58, Bowersox (2007) – p.81, Bask (2001) - p.102, Halldorsson et al. (2007), - p.129.</p>
<p>Is the non-contractually based relationship in the logistics triad a potential weak link in the chain of supply? (The non-contractually based relationship was shown on a diagram of the triad as the inter-link between the LSP and the Consignee)</p>	<p>Many academics have argued that closer coordination or collaboration of all interfaces in the supply chain is critical to support the goals of SCM: For example: Skjøtt-Larsen et al, (2003) – p.61, Whipple and Russell (2007) – p.61, Barratt (2004) – p.62, Mentzer at al (2000) – p.62 and Simatupang & Sridharan (2002) – p.67</p> <p>However, only fleeting reference has been given to the potential weak link in the chain of supply between a service provider and the consignee if an activity such as logistics is outsourced. The findings from the case study suggested that this was a potential weak link.</p>

<p>Do you personally feel that the non-contractually based relationship in the logistics triad is a strategically important link in the chain of supply to warrant a renewed management focus?</p>	<p>This question further probed into the notion that successful SCM strategies cannot afford to contain weak links. Authors such as Thompson and Sanders (1998) point out that “a supply chain will only be as strong as the weakest link” – p.93</p>
<p>Do you personally feel that the logistics triad concept is feasible and scalable across the supply chains you are familiar with?</p>	<p>The research focussed on a single case study and thus a critical question surrounded the notion of scalability. Larson and Gammelgaard (2001) p.121 noted that the logistics triad existed across logistics service provision in Denmark – but could the success noted in this trail have wider applicability?</p>
<p>In logistics provision which business – business interface do you feel is the most problematic link of the logistics triad?</p>	<p>The findings from the case study suggested that it was the third dyadic inter-organisational relationship between the LSP and the consignee where problems were most prevalent. The question probed into this questioning the most problematic link from LSPs and their customers</p>
<p>Do you feel that the logistics triad alignment focus is a legitimate supply chain strategy which should be addressed by members of logistics triads?</p>	<p>The case study showed that improvement could be made by pursuing a more aligned logistics triad. The question sought to enquire into the wider applicability of the strategy in other logistics settings. If there was positive support this would confirm findings of Beier, 1989, p.117, Gentry, 1996, p.120 and Larson and Gammelgaard (2001) p.121, who all reflected that there was potential in aligning logistics triads more optimally.</p>

Table 9: Questions Tabled at the Second Morning Session at the Conference held at the Belfry Hotel in the Midlands in the UK on 27th February of 2008.

The responses again provided a valuable and interesting insight into the views of industry practicing personnel to the findings emanating out of the case study. Although there were significant limitations which should be acknowledged surrounding issues such as audience composition, which have been discussed above in 3.4.2 these were important findings and added a considerable degree of confidence to the meaningfulness of conclusions and the fact that the findings from the case study had relevance to the wider practicing logistics professional community.

The results and analysis from this exercise are presented in full in Chapter 6 of the thesis.

3.5 Conclusions

The purpose of this chapter has been to present the principal methodologies deployed in this research study. Discussions around the internal validity, representativeness and generalisability of the research have been discussed and the theoretical legitimacy of the research along with the perceived limitations of the methodologies adopted has been presented.

Halldorsson and Aastrup (2003) and Lambert et al (2004) describe how validity of research can be assessed on the “trustworthiness” of the approach. They argue this contains four components which relate to the internal validity, reliability, external validity, and objectivity of the study: they are; credibility, dependability, transferability and conformability.

Credibility – concerns the match between the researcher’s descriptions of reality and reality itself. In the case study the respondents had a chance to review the research and findings and correct any misinterpretations. This was completed after each of the review stages of the research after the initial findings, and the first and second review meetings.

Dependability – concerns how similar the results would be if similar methodologies were deployed. Although this is the first case study which specifically focused on the logistics triad the methodological approach has been set out clearly. By redeploying the research over a longitudinal time span this extended period of observation has also enhanced dependability

Transferability: - concerns the degree that the study results can be applied to additional contexts (Erlandson et al, 1993). Although an argument for quantifiable generalisation cannot be made, a case for analytical generalisation has been advanced. Further support for more generic implications of the research has been developed from Phase Three of the study.

Conformability – concerns the ability of the study results to be confirmed through the data. Proof of improvements in the case study logistics triad has been obtained from performance, opinion and behavioural data sources in an attempt to triangulate the findings to provide confidence in the conformability of the findings.

It has therefore been demonstrated that the research has been conducted in a thorough and robust manner.

The chapter has also highlighted the difficulties of conducting rigorous, valid and generalisable research in the field of business management. To best address this challenging task it was proposed that the aim should be to take a trans-disciplinary approach. Thus the research problem was framed in the context of application with the research activity driven by both theory and practice simultaneously. The two main methodological approaches adopted based on deductive and inductive research strategies were outlined and justified. The details of supporting generalising phases, applied to the findings of both the preliminary study and the longitudinal case study were then also set out. The strengths and limitations of each of the alternatives were explored and presented and the considered reasons for determining these research approaches compared to other alternatives discussed.

The remaining chapters present the findings from the research process outlined above.

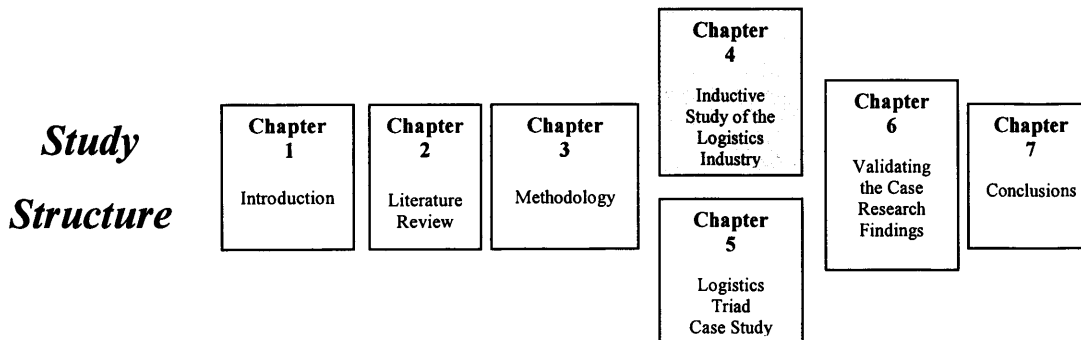
Chapter 4

PRELIMINARY RESEARCH - AN EXPLORATORY STUDY

An Inductive Study of the Logistics Industry

Chapter Aims

- △ Through a preliminary inductive study provide insight into the pertinent perceptions and attitudes to logistics service provision across the logistics triad in two sectors:
 - the steel sector
 - the grocery sector
- △ In combination with the Literature Review refine the focus of the thesis onto the Logistics Triad and support the development of two principal research questions



4.1 Introduction

This chapter presents the exploratory research phase of the study. This phase is also known as the Preliminary Study (Bennett, 1991). At the outset of the research a wide-ranging initial question provided the broad focus of the research. The question was:

“What is the influence of modern Supply Chain Management thinking in the way outsourced logistics provision is conceived and practiced?”

In reflecting upon this it was concluded that a preliminary exploratory study was best suited to this first phase of the research – **Phase One**. This resulted in a decision that the **inductive**, theory-building approach would be more appropriate for this phase. This exploratory study was designed to develop a better understanding how the logistics provision could be organised and managed to support mutual gains for all SCM participants. From this research a sharper focus on a core unit of analysis, the logistics triad, was arrived at. By combining the learning from the Literature Review and this Exploratory Chapter, more focused research questions were concluded upon to be tackled in **Phase Two** and **Phase Three** of the study.

In summary this chapter in combination with the Literature Review serves three principal purposes:

- △ Firstly, it provides a greater insight into the research questions, which are confirmed at the end of this chapter, and helps to channel the research focus to this end;
- △ Secondly, it inter-relates the empirical reality of logistics provision with academic research and theory;
- △ Finally, it represents a piece of considered research in its own right using an inductive approach.

In short, the chapter aims to provide valuable insight into the pertinent perceptions and attitudes to logistics service provision across the logistics triad.

A Preliminary Study can be conducted in a variety of ways (Saunders et al, 2007); attachment to your chosen organisation, conducting informal discussions with people of experience in the field and so on. The methods deployed here include numerous semi-structured interviews, focus group sessions, discussions with experienced personnel, notes from meetings with practitioners, personal attachment to logistics companies (which included conducting a day's deliveries), and notes from sponsored presentations.

Two sectors are focussed upon: **the steel manufacturing sector** and **the grocery sector**. These two sectors are chosen because they provide quite different supply

chain models and levels of supply chain maturity. The steel sector is relatively traditional in its application of SCM practices and thinking with a functional approach still clearly evident, although there is ambition to move towards becoming more supply chain orientated. By contrast the grocery sector has been transformed over the last three decades and is now considered to be one of the more advanced sectors in terms of SCM practice. It should also be acknowledged that the choice of these two sectors for this study is influenced by their involvement in the on-going funded research programmes (ITeLS and McCLOSM) from which the research in this study has been developed (please see Preface).

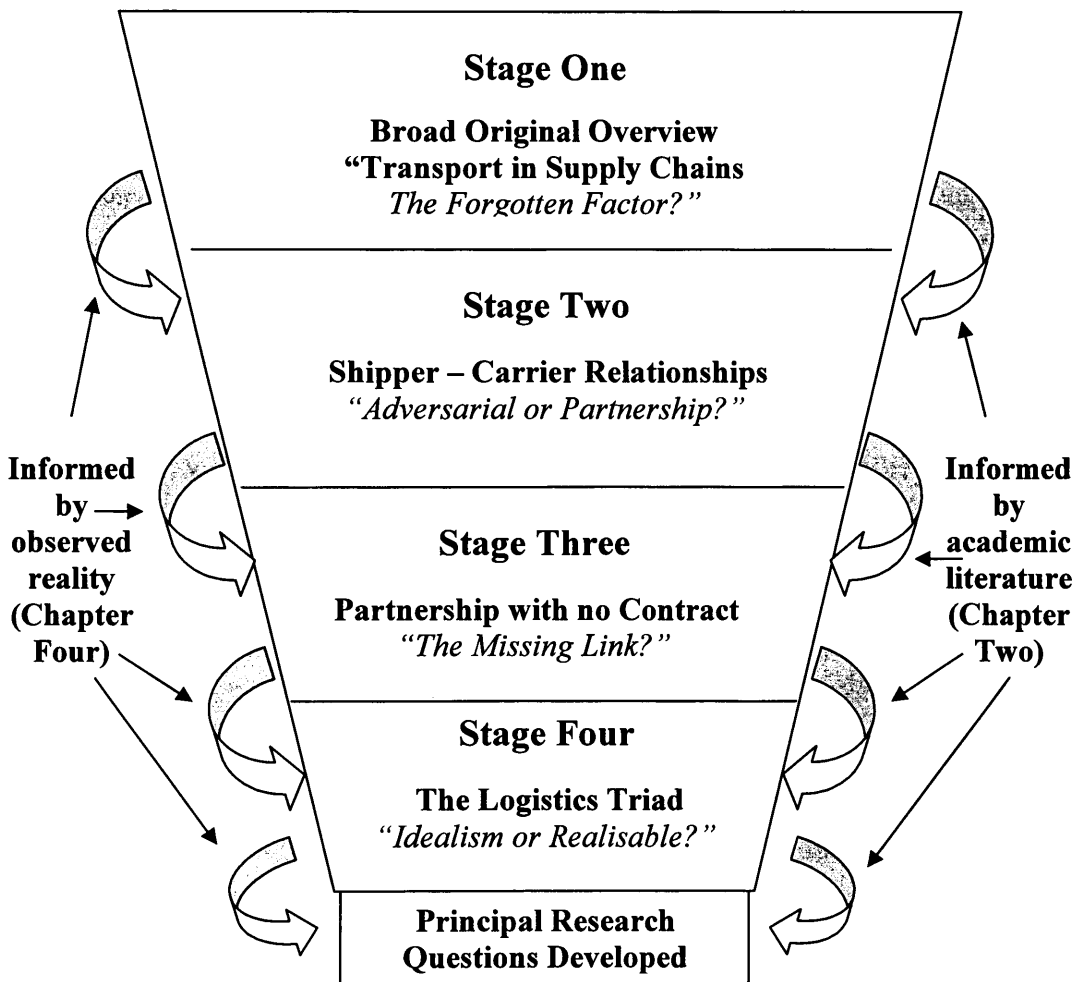


Figure 40: A Conceptualisation of how the Preliminary Study in this Chapter in Combination with the Literature Review Leads to the Principal Research Questions

For each sector the chapter is categorised into **four Stages**, each of which reflect the four relationships of the logistics triad used to frame the Literature Review. The two

initial Stages of focus are on the two core relationships - Relationships 1 and 2, the Buyer – Seller and the Shipper – LSP relationships. These two relationships are usually underpinned by a contract, in contrast to the third dyadic relationship, Relationship 3, between the LSP and the Consignee which is much more informal (Stage 3). Finally, the challenge that Beier (1989) foresaw in being able to “monitor improvements and distribute the costs and benefits” across the logistics triad, is explored in Stage 4.

Within all of the four Stages a narrative analysis has principally been used for each sector. This can be broadly defined as, “an account of an experience that is told in a sequenced way..... that, taken together, are significant for the narrator and which convey meaning to a researcher” (Coffey and Atkinson, 1996). Saunders et al (2007) add that a narrative account that, “clearly explains, for example, the social and organisational context within which a research participant operates, the nature of their engagement, the actions that they took, the consequences of these and events that followed may be analysed most effectively in its original form – this will retain the narrative flow of the account and avoid losing the significance of the social context within which these events occurred, or de-contextualising the data.” To further assess the study a summary table is presented for each sector derived from the feedback from professional practitioners from each of the two sectors. The tables aim to provide a categorical indication of the qualities observed in SCM practice in each sector. This is based on the qualities identified as desirable in good SCM practice; predictability, velocity, reliability and reactivity. For each sector there is also a supporting table which provides a pattern matching analysis of the narrative feedback. To achieve this a simple subjective scoring of high, medium or low is apportioned to each of the quotes in terms of the four nominated categories of desirable supply chain qualities (predictability, velocity, reliability and reactivity). The results give supporting credence to the overall findings for each sector.

The first sector which is reported on is the steel sector.

4.2 The Logistics Triad Relationships in the Steel Sector

The steel sector in the UK is selected as a focus for the study because it offers very different challenges in terms of SCM than other industries. For example, as will be observed after this exploratory review of the steel sector, the grocery supply chain can be characterised by its pseudonym – the Fast Moving Consumer Goods industry. The steel industry however, is rarely described in this way. Through the interviews, discussions, attachments and studies of this sector an interesting picture emerges of the issues faced by operators in the steel supply chain.

All three dyadic relationships in the logistics dyad are reflected upon before the focus switches to the tripartite relationship inter-linking all three players together. The presentation is structured around four key words which were concluded upon in the Literature Review as being important in good SCM practice:

- Δ **predictability,**
- Δ **velocity,**
- Δ **reliability, and**
- Δ **reactivity**

Each, it could be argued, when taking a Resource Based View of the Firm, is a competence which when combined with any other can produce capabilities which have the potential to support a sustainable competitive position.

4.2.1 Introduction

The Literature Review notes that there are some sectors in which, for various reasons, a functional mentality still prevails. This is in contrast to what Mentzer et al, (2001) term a “supply chain orientation”, where a more process-orientated philosophy to the conduct of business exists. The steel industry, despite having ambitions to be more “supply chain orientated”, is more functionally orientated than (for example) the grocery sector. This is borne out from the feedback of its operating personnel and managers.

“The order chain in the steel industry does not flow smoothly”

Commercial Manager,
Hot Rolling Mill, Steel Products Manufacturer, R

This view was found both between functions within firms as well as between firms.

“People are not working together here...they are looking after their own little bit”

Supply Chain Development Manager,
Major Steel Producer, O

The reasons for this approach are manifold but four factors stand out. Firstly, the steel supply chain is invariably founded upon a capital intensive asset base. The scale of investment in fixed assets such as machines, furnaces, cranes, manufacturing sites to name a few areas is considerable.

Supply Chain is organised around asset base and not customer base

Supply Chain Manager,
Major Steel Producer, O

Secondly, steel and its constituent raw materials are commodities. The economics of any commodity will determine the price cycle and steel suffers from considerable fluctuations in world prices. The effects of the pricing cycle create volatility which both influences buyers' behaviour and produces manufacturing challenges for all companies involved in the steel sector.

“Steel is a very volatile market – when price collapses volumes collapse. Price agreements have to match raw material buying prices”

Supply Chain Manager,
Major Steel Producer, O

Thirdly, production is usually organised in large batches, especially further up the supply chain away from the end consumer. This is dictated by the need to keep the

assets of manufacturing as intensively occupied as possible. As will be reflected upon, this has a number of effects all of which would be atypical characteristics of a supply chain orientated approach, such as long lead times, long production runs and a lack of flexibility.

“There is a lack of flexibility in steel operations due to constraints in batch sizing, large fixed assets, and high energy costs”

Supply Chain Manager,
Major Steel Producer, O

This issue contributes to the fourth factor – the pervading culture of the industry. In keeping with organisational studies of firms where mass production is the dominant production regime, the steel industry is more hierarchical, bureaucratic and functionally incentivised, with longer communication channels and order lead times than observed in many other sectors. These factors combine with a more traditional mind-set where there can be a resistance to change or new ideas.

“Operators tend to be used to work in one set way – they do not like new procedures. I have tried various ideas – I continually meet resistance from the shop-floor”

Quality Manager,
Cold Rolling Mill, Steel Products Manufacturer, R

These factors combine to produce a scenario where it is very difficult to compete through a “supply chain orientation”. Price is a dominant value criterion and service levels are well below what would be considered acceptable in the grocery sector.

“During quarter 1 in 2006 it was not uncommon for service levels (a measure of our steel suppliers’ ability to deliver the steel we ordered at the date the supplier sets in full) to be below 50%!”

Managing Director,
Multi-National Steel Products Manufacturer, P

“40% roughly of the customers place 3-5 months demand forecast, then tentative orders will be confirmed the week before processing. We are good at trouble-shooting, but to maintain a consistent high performance level to customers is not achieved yet.”

Supply Chain Manager,
Major Steel Producer, O

At one site the Site Director was asked to outline and explain the supply chain strategy. The reply was – *“there isn't one”*. He added, that his Divisional Director's strategy was to, *“channel steel making into the most profitable routes to market”*.

Site Director,
Hot and Cold Rolling Mill, Steel Products Manufacturer, R

Practitioners' views on the state of (and the key issues related to) each of the four relationships in the logistics triad will now be presented and reflected upon, starting with the primary relationship in any logistics triad: between the Buyer and the Seller. In the Literature Review it was noted that the inter-relationship between the Buyer and the Seller incorporates many more operational inter-linking activities than just the physical logistics material handling and directly associated processes. Would this view be confirmed in the views of many of the practicing personnel? How critical a role do the primary entities of the triad feel LSPs play in practice in the steel supply chain?

4.2.2 Relationship One: The Buyer - Seller Relationship

The portrayal of logistics provision across this “primary” interface is mixed in the Literature Review. Some authors fail to include outsourced logistics at all in their conceptualisation of the supply chain (Harland, 1996) and others conclude that it is a “forgotten factor” of the supply chain (Quinn, 2000). On the other hand some authors consider logistics as playing a critical role in modern SCM and promote logistics as a strategically important activity, capable of providing the basis of a sustainable competitive advantage through the adoption of a “supply chain orientation”. Where would the consensus lie in practice in the steel sector? To provide insight into this each of the four qualities cited in the literature review as being important in SCM are

reflected upon with reference to the views of Buying and Selling personnel in the steel sector.

4.2.2.1 Predictability

Perhaps not surprisingly, predictability of orders between Buyers and Sellers of steel products tends to be considerably poorer than in many other sectors. When a steel product manufacturer places an order on a steel producer the order needs to be usually placed many weeks in advance on the appropriate rolling cycle. Sometimes these cycles are spaced out many weeks apart due to the needs to ensure long batch runs and because of the wide range of product specifications available. However, the customer is not obliged to honour this order. When the order has been made and is due to be despatched the supplier will then ascertain whether the customer wishes to proceed with the order or not. It is only at this stage that an order is confirmed ready for despatch for the LSP to pick up and deliver.

“Our current planning system has a 3 months forecast, with 1 month frozen”.

Commercial Manager,
Hot Rolling Mill, Steel Products Manufacturer, R

Because of the long lead times involved, some stock is ordered speculatively (i.e. with no firm customer commitments). This can however result in overstocks where the grade of steel or size specification is different than actual customer orders or where the forecast is over optimistic.

Even a fairly small steel products manufacturer serving niche markets interviewed stated that inbound inventory stocks were over £30 million with about £3 million of this being virtually obsolete due to inaccurate speculative ordering.

“some feedstock is speculative; variations by customer and grade is significant in terms of volumes.....in stainless steel: one grade has been 3 months in stock because it was oversize.”

Purchasing Manager,
Hot and Cold Rolling Mill, Steel Products Manufacturer, R

4.2.2.2 Velocity

The length of lead time invariably involved means that there is less pressure on the speed of the supply chain than in the grocery sector. Generally, orders are booked for a specific week rather than the tighter delivery windows required in the grocery sector. Nevertheless, there is evidence that steel companies are thinking how they could improve their competitive position by improving lead times. This has led to an alternative to the more normal Make to Order (MTO) scenario for some more popular specifications where demand is more predictable. Instead, the product is made in advance to stock (Make to Stock - MTS). When the actual order is received it is then pulled from stock on a much shorter lead time.

Even on MTO lines, competition in certain economic cycles of the product is forcing players to consider tightening lead times.

“An improvement in delivery times could be very good for our business (last year our 4-5 weeks lead time was considered very good compared to competition). Now we are looking to achieve less than 4 weeks”

Production Manager,
Hot and Cold Rolling Mill, Steel Products Manufacturer, R

For some steel product producers, especially further up the supply chain nearer the end-user and/or serving certain markets with more advanced supply chain orientations, demands on them are more stringent. For instance, Original Equipment Manufacturers (OEMs) in the automotive sector dictate that deliveries have to be similar to the standards evident in the grocery sector – perhaps even more exacting.

“Company X have been a very important and very demanding customer; they want delivery in a four hour window”

Site Director,
Hot and Cold Rolling Mill, Steel Products Manufacturer, R

Generally though, there is much less focus on lead time than in the grocery sector. This led to the following comment:

“There is no overall lead time measurement. It varies with customer requirements. Raw material availability is the key. We will look at lead time when scheduling individual orders i.e. next available cold rolling weeks

Production Manager,
Cold Rolling Mill, Steel Products Manufacturer, R

4.2.2.3 Reliability

The principal measure for meeting customer requirements in many steel producing sites is DOT. However, this is not *delivered on time* which is common in the grocery sector, or the equivalent opposite FTA – *Failure to Arrive*. DOT actually stands for *despatch on time*.

This is an interesting insight we will reflect upon in the next section on Shipper – LSP relations in the steel sector. If the product is ready for despatch on time then according to many steel producers despite the product not having reached the customer yet, they perceive their job has been completed. Even so, achieving highly reliable DOT (despatch on time) scores is very unusual in the steel sector.

It is arguable that there is more attention built into technical product specification quality than process adherence quality. This is often where steel producing firms believe their strength lies. For instance the Quality Manager at a Rolling Mill stated:

“Our strengths revolve around our technical knowledge related to our knowledge of our customers and knowledge of material..... I try to build quality into the process – build in customer issues of quality. But I still get called in at every stage of the total process: inbound material, steel in the mill, finished coil and so on”

Quality Manager,
Cold Rolling Mill, Steel Products Manufacturer, R

In addition, where markets are susceptible to considerable fluctuations in price it is not uncommon for contracts taken out not being fulfilled if it works in a supplier's or a customer's favour to do so.

“Contract length can be important in terms of profitability. In the market if you have a twelve month contract sometimes customers consider this a pain because requirements change and they want to buy from somewhere else”

Commercial Manager,
Hot and Cold Rolling Firm, Steel Products Manufacturer, R

4.2.2.4 Reactivity

No consistent pattern to the capability to react was evident. Due to the long batch runs, functional focus and production orientation, it is more common to find examples where steel sellers are not able to react, even if there is willing, to customers. However, there were exceptions to this overall general picture especially for important customers, and in some cases managers were self-critical, suggesting that their companies were too eager to respond, but that this also had knock on effects for other customer orders.

“Steel suppliers want larger volumes (enabled by doing easier grades and bigger production runs), whilst many steel product manufacturers are looking to differentiate themselves by supplying niche products – therefore there is an inherent mis-match”

Divisional Director,
Major UK Steel Supplier, S

4.2.2.5 Conclusions

In essence there are three separate operations in steel logistics: manufacture, loading, and transport. However, in common with the findings in the Literature Review the Buyer–Seller inter-relationship is involved in many issues beyond logistics provision. Logistics activities, although self evidently critical to effective SCM, as they involve the successful handling and movement of product between the Buyer and Seller, are only part of the shared issues which may be of interest in the primary relationship of the logistics triad.

“Relationships with production (regular meetings 3-4 times a week – involves continuous planning, technical updates): relationships with customers (specifications, order volumes, prices, delivery issues and management of joint customers with cold

business); on buying side issues with suppliers (especially when suppliers don't want to make some specifications), batch sizes, contracts etc.

"In most steel organizations the buyers have little to do with transport so it is a constant battle to explain the implications of their actions sometimes."

Systems Manager
Multi-National Logistics Company, N

The concept of closer relations beyond the pure transactional is generally not prevalent or well developed. Elements of collaborative types of behaviour were evident but invariably did not exist consistently at operational, tactical and strategic levels simultaneously. Often there were examples of inter-relationships formed through individual arrangements between players. Collaboration formed due to a deliberate and thought through strategic supply chain orientation was rare.

"Collaboration is based on when we need it. For example if one customer wants a wider slab we would go there and they would run some trials."

Commercial Manager,
Hot and Cold Rolling Mill, Steel Products Manufacturer, R

Even internally within steel companies, there was evidence of a fairly fragmented and functionally orientated culture. For example:

"Commercial division needs a better understanding of the logistics processes"

"We have an "us and them" culture – shop floor people are not welcome in the management building and management will not go onto the shop floor"

"Sales have a relationship with some customers but this does not involve logistics provision"

Various Managers and Personnel,
Hot and Cold Rolling Mill, Steel Products Manufacturer, R

This functional orientation is also reinforced by some of the measurement systems. However, there are some process orientated measures being introduced.

“We have introduced a new lead time measure: stock-turn ratio per unit: it measures the receipt of orders through despatch (within this it’s MTO rather than MTS)”

Site Director,
Hot and Cold Rolling Mill, Steel Products Manufacturer, R

What does this mean for logistics provision and for the role of the logistics provider within the logistics triad? Fundamentally, it leads to the conclusion that logistics is not integrated within the supply chain operation in steel supply chains. This appears to be more evident than the comparative position in the grocery sector which will be reflected upon in the following section.

“Fundamentally there is a disconnection between the selling function and the delivery function. Put on top of this the disconnection between the manufacturing function as well and it is little surprise there is little joined up thinking. So there is a strong correlation between loss of efficiency and increased internal costs. Logistics costs increase as weights decrease.....

the commercial arm is keen to deliver on time as agreed and is worried about a loss in market share if this does not happen. So there is a disconnection between delivery efficiency and market share. If you dominate a market then you can focus on efficiency.”

Managing Director,
Leading Multi-national Steel Logistics Company, M

But invariably, LSPs are not managed as part of the decision-making process and are seen more as servants than as true partners. This led to one senior logistics commentator stating:

“There should be a wish to see transport as part of the process and not be bullied into making effective/efficient deliveries”

Managing Director,
Logistics Technology Provider UK, T

4.2.3 Relationship Two: The Shipper – LSP Relationship

This discussion leads into the section which focuses on this Shipper – LSP inter-relationship in the steel sector. Movement of steel between sites in the UK is either undertaken as a rail or a road movement. Usually this decision is taken fairly early after the call off of the order – if there is sufficient volume due to be moved between two sites and rail is a feasible option it goes by rail – the rest goes by road. Even on rail some of this steel movement can be taken on part of the journey by road from a rail hub, such as the one sited in the West Midlands, to the customer’s premises. Journeys from ports also are often moved by rail then road via the railheads.

The haulage element of logistics has become much more competitive in recent years. As a consequence rates have not kept pace with costs and this has seen operating margins shrink quite considerably. This climate has been exacerbated by unprecedented increases in one of the biggest cost areas – fuel. Many of the medium and larger sized players have been able to build in fuel escalators into their contracts but for the smaller hauler faced with frequent changes (predominantly increases) in fuel this can be a very problematic area.

One of the principle ways to manage costs down is to ensure vehicle fill rates are as high as possible.

*“For transport the key is to achieve better vehicle fill levels. When you look at the big issues in the costs of distribution it is the fill rate that it is the principle key.....
For example – our work for ASD is monitored by month. This year the fill rate (28 tonne capacity) for February was 80.9% and the cost per tonne was £14.74.
In March the fill rate was 82% and the cost per tonne went down to £14.08.”*

Managing Director,
Leading Multi-national Steel Logistics Company, M

By integrating traffic flows better considerable savings can be realised argued one leading steel logistics service provider

“In one recent year the average payload was 20.4 tonnes and the average delivery was 18.7 tonnes – there were even 2% of deliveries less than one tonne. With the maximum payload being 28.6 tonnes there is the potential saving of up to 30% per tonne!”

Managing Director,
Leading Global Steel Logistics Company, M

This finding is also endorsed by many of the transport managers at the Shippers who acknowledge fill rates are important – often the contract is based on a tonnes shipped rate so there is a built in incentive to achieve a good average fill rate. The problem appears to be in integrating this across the Shipper’s business. The sales department often secure the sale first and then think about the logistics implications as a second thought!

“Our transport is outsourced to an experienced logistics company.

Whilst there are no performance measures available for transport the measure used is the despatch in full measurer not really an OTIF.

What is considered is the utilisation of full vehicles and minimum weights.”

Site Director,
Hot and Cold Rolling Mill, Steel Products Manufacturer, R

Achieving high fill rates are especially tough when an LSP goes infrequently to a location. Developing a critical mass for deliveries to and from locations is crucial. To support this planning is vital; but in steel logistics, demand for logistics services such as haulage is rarely predictable and is often managed on tight lead times which prevent effective integrated transport planning taking place!

4.2.3.1 Predictability

One of the issues of large batch runs, long lead times and poor service levels, is that demand amplification, or bullwhip effects, further exacerbate the problems experienced. No entity in the supply chain has a firm idea about what true demand levels are, and as a consequence, demand signals can be very misleading. For requirements for logistics service demand can be very volatile!

*“Forecasting drives the bullwhip effect.
Under or over approach is typical in many industries.”*

Managing Director,
Leading Global Steel Logistics Company, Q

As was noted at the outset of this discussion, logistics provision is an asset intensive business with relatively low margins. It is important to ensure any fixed assets which are owned such as in road transport the trucks, trailers, drivers and so on are deployed as intensively as possible to ensure costs are controlled and returns are optimised. To achieve this, LSPs prize stable and predictable demand for their services, planned well in advance. Therefore, in practice, a great deal depends on the volatility of demand. Unfortunately, this invariably is the exact opposite of the business conditions they have to operate within where demand is fickle and bullwhip effects exacerbate the conditions for further amplification of demand.

“The logistics business we are in has a high degree of fixed costs (vehicles, drivers, trailers). If volume of business does drop off the company feels it “big style”. The fixed cost cannot be suddenly taken out.”

Managing Director
Leading UK Based Logistics Service Provider, M

In logistics this might mean during one period there is huge demand for assets such as trucks and trailers for shipments while in the next period demand is minimal and assets have to remain idle!

One tactic used by some LSPs is to locate personnel from the LSP at the main sites. This can help to predict demand levels as much in advance as possible (and where possible help smooth the flow of demand). This is especially attractive where logistics companies have a full dedicated contract for a site.

“Our company currently have on-site representatives at large sites. This helps greatly to remove second guessing and smooth business operations.”

Managing Director
Leading UK Based Logistics Service Provider, M

Another tactic used to help manage this is to constrain the size of the fleet and sub-contract to deal with peaks in demand. A degree of margin is lost but it protects the company from being too exposed. This issue is discussed further in the reactivity section below

In order to make the business model work in fairly harsh business conditions LSPs place a premium on building inter-linked jobs where an away leg is matched with a return backhaul.

“Our operation is all about balanced flows. It is crucial that our ability to manage flows is maintained. We will often mix flows from different customers. For example we may match a leg from Arcelor in Barking to the Midlands with a leg in the opposite directionthis may look quite attractive on paper but if there is no reverse flow our price for quoting for the job would be quite high”

Managing Director

Leading UK Based Logistics Service Provider, M

Another way of achieving balanced flows is through what is known as “tramping”.

The foundation of our success is “Tramping”. This involves connecting man trips through the working week as follows:

Mon – Home base South Wales to Midlands – then to Shotton

Tues – Shotton to North East

Wed – NE to Midlands

Thurs – Midlands to London

Fri – London to South Wales

= “Mix and match” operations. Backhauling is normally viable when done from nearby locations, up to 75 miles radius. However this depends on the size of the vehicle.

Managing Director

Leading UK Based Logistics Service Provider, M

This kind of integrated planning is great in theory – it is achieving it in practice that can be problematic. Firstly, there is the issue of planning time which, as has been observed and commented on above, is restricted. Another issue connected to this is delays to schedule. Clearly, some of these may be connected to congestion and traffic intensity on the roads. However, in addition and arguably the greatest issue contributing to wasted resources and unfulfilled “tramping” plans, are delays.

“Delays are our greatest wasteit costs approximately £35 per hour to “stand” a vehicle.....every “excess” hour’s delay, loses the ability to delivery 10 tonnesit can average as much a 5 hours per delivery - > 2 hours is common placeit leads also to frustration for drivers..... we need to accept the principle that delays are costly and need action.....we need to revise intake or despatch programmes to avoid delays.....in short work together to eliminate delays”

Managing Director,
Leading UK Based Logistics Service Provider, M

In conclusion, in steel distribution, if you cannot have predictability you need business models which can cope with the uncertainties that result.

“Demand uncertainty is still the critical area to be focused on”

Managing Director,
Leading UK Based Logistics Service Provider, M

This is either achieved by being able to smooth out the peaks and troughs to a certain extent through managing customers to accept a different delivery than was asked for, or by building in flexibility, notably in terms of developing a sub-contract support fleet capability.

“Currently we prioritise loads especially at peaks. Some work it is vitally critical to deliver on time in full as promised – others it is less vital and the job can be moved to smooth the peak” and

“In steel distribution flexibility is the key to achieve mix and match transport solutions”

(Both from) Managing Director,
Leading UK Based Logistics Service Provider, M

One novel transport planning scheme was explained by one of our interviewees. In essence it re-positions the transport role in that rather performing a servant role – doing what is asked – it is more assertive in managing demand to its transport capability. A similar system is operated by the grocery retailers in terms of home delivery – when the Friday evening slot is booked up the customer has to choose the next best alternative for their grocery delivery!

“We only have so much transport capacity.

When a call off is requested we place this on a transport planning operation who fill up all the slots for each day. If the day requested is full we ask the customer to suggest an alternative.

We have been running this system for six months and so far we have not had any problems and we have achieved much higher fleet utilisation as a result”

Managing Director,
Multi-National Steel Products Manufacturer, P

4.3.3.2 Velocity

With the exception of supplies to the automotive sector there are generally low pressure levels to speed up the delivery lead time significantly. However, despite the lead time for steel products invariably running to a number of weeks, the call off lead time for transport provision can be much tighter than this. This can be frustrating for the LSP when in reality it could have been booked many weeks in advance.

An interesting point in this area surrounds lead times and their impact on possible fill rates.

“Lead-times for just-in-time (JIT) deliveries in the UK are shorter than those in France and rest of Europe. This comes about from last minute request for transport and responding to these is costly to transport operations.

In Europe more full loads are used.”

Managing Director
Leading UK Based Logistics Service Provider, M

When providing haulage, one of the issues which needs determining is the size of fleet and size of vehicles, which are predicted to offer a good service level without remaining idle for too long in slower periods.

“The question is choosing between different vehicle size capacities and regular available capacity. There are implications of payload versus cost of operations. In this position the milk round is still preferred as there is not much difference between articulated and rigid body lorries.”

Managing Director

Leading UK Based Logistics Service Provider, M

4.2.3.3 Reliability

The pressure on delivery reliability is again not as intensive as the grocery sector. As discussed many steel producers focus on measures at the end of the manufacturing process such as DOT (Despatch on Time) or ROTT (Ready on Time Tonnes) and do not formally measure delivery on time. They rely on customer feedback if there are any issues with late delivery rather than compiling a fuller supply chain measure which includes successful delivery. This is partly due to the steel industry sector which tends to be managed on a weekly rather than a daily basis (more common in the grocery sector) and partly due to the more relaxed supply chain focus which is inherent generally in the industry.

There are a wide range of reasons for late deliveries. They could be caused by:

- Transport problems
- Late arrival at despatch site for loading
- A loading delay
- Late scheduling – the job was not scheduled in time
- Late release – the job cannot be scheduled because the steel product (e.g. coil, or flat) has not been released from production (this could be because it has yet to cooled down sufficiently for example.)

Little effort is invariably completed with Shippers to understand why failures take place to build in improvement in a continuously improving manner.

“What is invariably needed is the capability to generate and keep further data on why failures take place – it is also clear that the data is available but what does it do to change anything – how do we change it?”

The theory is to drill down into logistics to understand it and to secure lasting changes which make a difference”.

Senior Manager,
Leading UK Based Logistics Service Provider, M

The trade offs required for consistent reliable deliveries need to be understood.

“Inevitably there is often a price of service. – I mean reliably delivering. To achieve a lean supply chain and just in time inventory you need resources and good supply chain metrics – but this is not a utopian world”

Senior Manager,
Leading UK Based Logistics Service Provider, M

Finally, yet arguably most importantly in terms of reliability, is safety. The steel industry in total has experienced a poor record in recent years in terms of safety and great efforts are now being placed by all participants to ensure safety is at the top of the agenda for all actors practicing in the sector. This clearly includes logistics whether this is outsourced or not.

“Safety comes top of the 3s (safety, service, and savings).

Service embraces quality as well. Safety however should be factored into all aspects of collaborative arrangements”

and

“Safety is the key issue within the steel/transport industry and relating this to behaviour is a challenge. There is a danger of “prescriptiveness” and it’s better to get people to think for themselves rather than being told what to do”.

Managing Director
Leading UK Based Logistics Service Provider, M

Indeed, a number of the companies included in this study have tried to lead the steel industry forward on this issue.

“Company X has led some of this such as the requirement for transport to have handbrake alarms and reverse indicators”. We also have been instrumental in leading safety standard improvements – for example handbrake alarms had to be installed on all vehicles conducting our business – own or sub-contract fleet by 01/01/06”

Managing Director
Leading UK Based Logistics Service Provider, M

On reflection, safety is a matter of and above quality, which is not factored in explicitly to Johansson et al’s (1993) value equation presented in the literature review. A revised version incorporating safety is indicated below in Figure 41.

$$\text{Value} = \frac{\text{Quality X Service X Safety}}{\text{Cost X Time}}$$

Figure 41: Johansson et al’s (1993) Value Model Including Safety

In discussion it was noted that “safety is a stand-alone measure which cannot be traded off against service or savings.” (Department for Transport, Manager). As a consequence of this a revised version would be this equation indicated in Figure 42.

$$\text{Value} = \frac{\text{Quality X Service}}{\text{Cost X Time}} \text{ X Safety}$$

Figure 42: Further Revised Johansson et al’s (1993) Value Model Including Safety

Safety considerations have also had significant implications in terms of competitive strategy. Sub-contractors must be able to adhere to the upgrading safety requirements,

which has meant sub-contracting arrangements must be established on a more formalised footing. Logistics operators in some ways are also aiming to differentiate their offering on safety grounds claiming that their drivers all have received a certain level of training and their vehicles adhere to certain minimum safety standards. This makes good common sense clearly but it is also a method of better competing with non-steel specialist hauliers. One particular issue that has grown in recent years is the influx of foreign based hauliers, some of whom are able to compete on price very competitively largely due to the cheaper fuel prices in mainland Europe.

“It is in the health and safety area that regulations regarding the sub-contract fleet have been improved”

and

“There have been examples of poor performance by foreign vehicle operators... I would suggest that safety should be achieved at any price”.

Managing Director

Leading UK Based Logistics Service Provider, M

4.3.3.4 Reactivity

Finally, it is when matters do not go to plan, when they need rectifying, that the capability to be reactive comes into its own as a key differentiator versus the competition, according to management theory – (see Resource Based Theory and case study findings of Zsidisin et al 2007 presented in the Literature Review). In steel logistics, close collaboration can help secure better reliability.

“Part of our strength as a logistics service provider is our capability to be close to the customer - Company X – and be able to be flexible to meet sudden surges of demand for transport at a particular mill. It is all managed through personal relationships.

Managing Director

Leading UK Based Logistics Service Provider, M

As commented on above, one of the methods used to improve reactive capability is to use a sub-contract fleet. The Shipper pays the same rate, so the sub-contractor receives a slightly reduced rate for doing the work, and the lead logistics company

retains a small management fee for arranging the work and retaining accountability for it.

“We aim to sub-contract around 20% of our work. If this reaches 40% this is too high.

A lot however depends on the volatility of demand.”

and

“It is interesting to note that in one company sub-contract arrangements were very

“bitty” a few years ago and this has been upgraded and tightened up.

This has also led to a rationalization of the sub-contract base which has now fewer companies generally larger ones. We feel it is important to get the balance of the sub-contract fleet right. As a consequence this has also resulted in collaborative relations

with the sub-contract base strengthening”

and

“We have also developed a rate schedule for sub-contract work. This includes a fuel

escalator system. Our customer’s rates include a fuel escalator which we pass

directly on to our sub-contract base. Overall, with the exception of the fuel escalator

our customers rates will be the same with us regardless of whether the job is sub-

contracted or not.....in return we demand a high standard of

achievement by our sub-contractors. They are obliged to feedback data on delivery

*time and when it has been off-loaded. There might also be demurrage*³ implications.*

Managing Director

Leading UK Based Logistics Service Provider, M

Figure 43 indicates that the logistics triad in fact invariably contains some sub-contract partners too.

³ Demurrage is the gap between arrival time and off-loading. Generally in the steel sector one hour is allowed for this

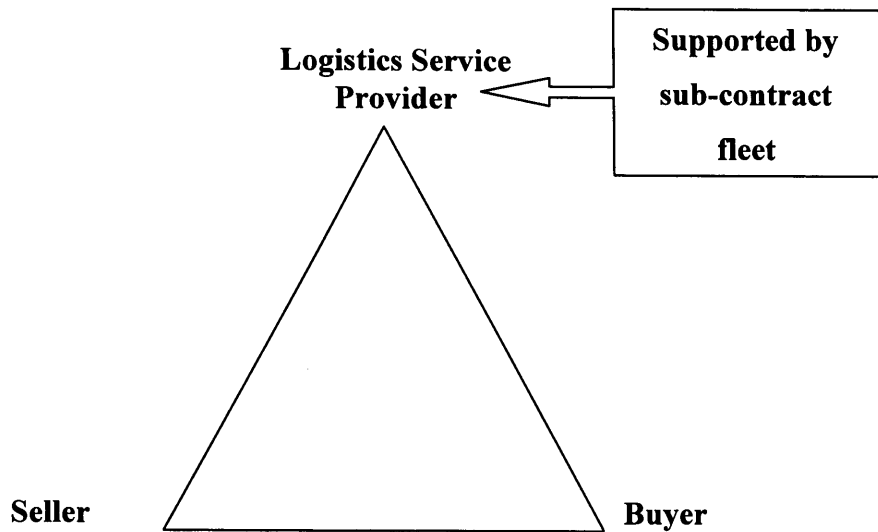


Figure 43: Basic Logistics Triadic Relationship Model for Steel Distribution

4.2.3.5 Conclusions

The steel logistics sector, as will be seen in the next section, is clearly very different to the logistics sector of the grocery sector. However, in basic terms, logistics transport in steel is all about delivering the service required at an acceptable price and hence it is perhaps not surprising that when interviewees are asked for their principal issues that cause them pain, the list could just as easily have been described by a grocery logistics practitioner. A typical answer to this question was given by one leading steel LSP.

“Our principal issues in transportation include:

- Δ *Capacity utilisation of vehicles in order to use backhauling and avoid half-empty running.*
- Δ *Travel distances*
- Δ *Waiting times for unloading*
- Δ *Flexibility and responsiveness*
- Δ *Integrated transport planning”*

Managing Director

Leading UK Based Logistics Service Provider, M

It was clear through the discussions with steel logistics customers and providers that the notion of a “supply chain orientation” was much less developed in the steel sector

than many other industries. One of the reasons for logistics becoming more of a strategic issue is when it is considered as a component of a supply chain strategy and therefore it is perhaps unsurprising that LSPs in the steel sector see themselves as “servants” rather than as “true collaborative partners”. This provides valuable insight into the potential perceptions and attitudes to logistics service provision across the logistics triad. Cost management still dominates the relationship in both sectors. In steel logistics just before the recent fuel price hikes (over the last year), these were the kind of figures that were not untypical in the sector.

“Predictable normal shifts for road transport (run at 2 shifts 5 days a week) equate to say £10 a tonne. For rail when you cost in infrastructure charges, network rail costs, wagon hire and damage (which can be quite high) this equates to £11 a tonne – (NB that running costs are only about 10% for rail so its relatively cheap to ship more volume through this mode). The expensive movements are the more unpredictable road shipments run on a single shift without balanced flows – say £14 a tonne. When this is all combined = £10.50 a tonne If more goes into the £14 bracket this cost will obviously go up – the key will be to bring this down to lower the overall cost.”

Managing Director

Leading UK Based Logistics Service Provider, M

In terms of partnering, LSPs conventionally enjoyed long standing repeating 2-3 year contracts with customers. Through this a degree of trust and understanding had built up especially at an operating and tactical level

“A lot of business depends on trust. An example of this would be the business in Scunthorpe and Hull. Often we send lorries depending on a feel rather than hard numbers. This might be a commitment of 5 vehicles. It is about gut reaction and feel.

This could not been achieved without a strong business relationship.”

Senior Manager,

Leading UK Based Logistics Service Provider, M

By enlarge however at an operating level there was a degree of frustration evident especially from the LSPs’ perspectives. They frequently claimed there was a lack of “joined up thinking” and felt strongly that although the transport element provided a

critical task in the supply chain – the delivery to the customer – they were not valued as they felt they should be. Indeed, many missed opportunities to achieve win-win scenarios were being missed.

“What factors adversely influence the cost of transport? – Lack of joined up thinking!...

The transport element of the supply chain is not a freely available disposable commodity!..... is it a master and servant relationship or a team effort working together in an integrated supply chain?”

Managing Director,
Leading UK Based Logistics Service Provider, M

It was suggested also that it was not just in cost terms that value could be improved from more “joined up thinking in steel logistics”. On safety matters, as has been discussed, collaborative management was perceived to be highly important by LSPs, and could be realised by a closer working relationship, the LSPs suggested.

“Our driver is your last contact with your customer! delays at delivery points can be overcome..... intelligence about customer off-loading facilities can be fed back”

Managing Director,
Leading UK Based Logistics Service Provider, M

4.2.4 Relationship Three: The LSP – Consignee Relationship

In keeping with the findings of the literature review this third dyadic relationship in the logistics triad was undoubtedly the least well developed in steel logistics. One LSP summed up the problem as they saw it.

“The issue is that while LSPs are generally customer focused in terms of improvements, the consignee is generally internally focused”.

Managing Director,
Leading UK Based Logistics Service Provider, M

This is a particularly telling statement and provides an insightful explanation into why many initiatives identified in this exploratory study and instigated by the LSP ended up not being realised. One Consignee likened in-bound transport to electricity.

“As far as I am concerned – in-bound deliveries of freight is a service just like a utility service like water or electricity supply. You do not think where it has come from, or what has been involved in getting it to you – but you do expect very high standards in terms of reliability.”

Site Director,
Hot and Cold Rolling Mill, Steel Products Manufacturer, R

In summary, there was generally no culture of motivation shown by the Consignee for involvement in supply chain development initiatives involving the LSP.

Examples of these initiatives were however, consistently provided by the LSPs with very mixed results. For some major customers LSPs had developed an on-site presence to help manage in-bound deliveries. However, this was predominantly with the Shipper rather than the Consignee. In another example there were attempts cited to explore the possibilities of night time deliveries which for the LSP was attractive as it allowed greater use of their vehicle assets, which otherwise would have been waiting idle until the next morning. In one example of this, the LSP even suggested to off-load the trucks themselves at no extra cost as well when the consignee said they would not open their site for deliveries. For the LSP this made commercial sense and ensured their vehicles were promptly turned around. Indeed, the issue of poor vehicle turnaround times at Consignee’s premises was a reoccurring theme.

“Waiting time at customer yards is a big problem impacting the flow of the operation. This is because of customers’ perception of transport. We need customers to take transport provider seriously”.

Managing Director,
Leading UK Based Logistics Service Provider, M

Again this comment was very insightful. The LSP was invariably taken for granted by the Consignee and this led to many examples of frustrations building up and inevitably to the development of poor distrusting relations.

4.2.5 Relationship Four: The Tripartite Relationship across the Logistics Triad

Given the evidence of the poor state of relations over the third dyadic interface between the LSP and the Consignee in the steel sector, it is no surprise that there was little recorded evidence of three way meetings or collaboration across the logistics triad between all three separate companies. The logistics triad as a concept did not really exist.

The only real evidence of any attempts to align the three parties across the triad came where the Shipper was also the Buyer and the LSP as providing a logistic service in moving product between different sites of the same company. Even here, little evidence of joined up thinking was found, and the LSP often was unable to act as an influential party in shaping winning solutions for all three parties.

To generate winning solutions to ensure the LSPs assets are as fully mobilised as possible, many LSPs chose to serve numerous steel customers linking up distribution networks between players to try and create the “tramping” synergies discussed above. In addition, many used a growing sub-contracting base to help them manage the peaks and troughs of demand for freight logistics services as efficiently as possible. Indeed, third party LSPs’ business models were invariably based around this concept and thinking. One LSP manager summarised the situation as this:

“The UK steel logistics industry appears to be stuck in a traditional time warp. What is required is a new way of thinking to motivate change and new ways of thinking to generate win-win-win scenarios across the logistics triad”.

Managing Director,
Leading UK Based Logistics Service Provider, M

4.2.6 Conclusions

To further assess the evidence provided an analysis of the narrative feedback was carried out. To achieve this, an indicative and subjective categorical description was given for the sector's SCM practice focussing upon the four nominated categories of desirable supply chain qualities (predictability, velocity, reliability and reactivity). The results were as follows and are presented in Table 10.

Desirable Supply Chain Qualities	Subjective categorisation of SCM qualities in the sector based on the narrative perceptions presented		Justification (derived from transcript perceptions presented above)
	Summary	Indicative Category Rating	
Predictability <i>The degree of forecast accuracy</i>	Demand uncertainty tends to be a key issue with long lead times exacerbating the issue (lead times in months rather than days)	Low	- "3 months forecast currently" - "demand uncertainty is a critical area"
Velocity <i>Improved inventory turns per year, or tightening the number of days of inventory on hand</i>	Inventory stock turn is substantially lower than industries such as groceries. Lead times for transport, perversely perhaps, are tighter for JIT deliveries than other countries such as France	Low/ Medium	"Delivery days are a big issue" "The supply chain is organised around an asset base not a customer base"
Reliability <i>Reduced variability of shipment times around the mean transit time</i>	The order chain does not run smoothly – resulting in low reliability levels	Low	"It is not uncommon to experience service levels below 50%"
Reactivity <i>The ease of accommodating special requests</i>	There is an inherent lack of flexibility in the steel sector due to batch sizing, large fixed assets, high energy costs	Low	"Operations tend to have one set way"

Table 10: Categorising Table Showing Indicative Ratings of Desirable SCM Qualities from Steel Practitioners Presented in the Inductive Study

To give further credence to Table 10 a pattern matching analysis of the narrative feedback was carried out. To achieve this, a simple subjective scoring of high, medium or low was apportioned to each of the quotes above in terms of each of the four nominated categories of desirable supply chain qualities (predictability, velocity, reliability and reactivity). The results were as follows and are presented in Table 11. They approximate to the findings presented in Table 10.

<i>Desirable Supply Chain Qualities</i>	<i>Classification of steel practitioners' views of the steel sector supply chain capabilities, as presented in the inductive study (based on a high, medium and low scoring system)</i>		
	High	Medium	Low
<i>Predictability</i>	1 (P)	1 (M)	1 (R), 1 (M), 1 (P), 1 (R), 1 (M), 1 (P), 1 (M), 1 (M), 1 (M)
<i>Velocity</i>	1 (R), 1 (M)	1 (R)	1 (R), 1 (O), 1 (R), 1 (O), 1 (R)
<i>Reliability</i>		1 (M), 1 (M)	1 (R), 1 (M), 1 (R), 1 (N)
<i>Reactivity</i>	1 (M), 1 (M)		1 (R), 1 (O)

Table 11: Pattern Matching Table Showing Spread of Quotations from Steel Practitioners Presented in the Inductive Study

Steel is a highly competitive industry with price invariably being the key issue in determining winners and losers. Although the notion of SCM has been considered and service level improvements are recognised as desirable, service enhancements cannot be at the expense of price. This is one of the reasons why there has been relatively little progress made, especially at the production end of the chain, in terms of SCM compared to industry sectors such as automotive, electronics and grocery.

The development of relations with LSPs, are, as a consequence, despite being largely made up of on-going two or three year contracts, more characterised by a transactional rather than a collaborative mentality. There appears to be a disconnection, across the logistics triad between the product buyers and sellers and the logistics providers. This is compounded by the unpredictability of the fulfilment of the product orders.

However, leading players in the steel industry are beginning to adapt and indeed some of the practices adopted by the supposedly more advanced supply chain industries are beginning to creep into the steel sector. This is especially found further downstream towards the end-users of steel in more advanced industries in terms of SCM, such as manufacturers using steel products in the automotive sector.

4.3 The Triad Relationships in the Grocery Sector

In the UK, there is intense competition between the major grocery retailers. This is despite the market effectively being an oligopoly with just four major companies controlling over 70% of the market (Burt and Sparks, 2003). Principally this study's focus is on the manufacturer – retailer interface and from a UK perspective, although a number of the findings also incorporate viewpoints on the inbound chain of manufacturers and are derived from companies which have pan-European operations, and are global multi-national companies.

4.3.1 Relationship One: The Buyer - Seller Relationship

4.3.1.1 Predictability

- Forecasting and Inventory Management

In many supply chains, products are manufactured and distributed based on forecasts and “pushed” through the supply system. As all actions are then based on forecasts, a large focus of collaborative management effort between the Buyer and the Seller in the grocery sector is placed on trying to “get forecasts more accurate”. This is made harder because real demand is rarely flat and easily predictable.

“I am in charge of 40,000 sku (stock keeping units) in stores – demand is always undulating”

Supply Chain Director – Ambient Goods,
Major UK based Grocery Retailer, A

“My role is to get heavily involved in leading the group from the perspective of trying to understand the demand from the retailer ... for forecasting this is done as collaboratively as we can”

Customer Supply Manager,
Multi-National Branded Grocery Manufacturer, D

“The business planning function is now becoming so integrated – everything revolves around planning – the challenge is to plan in accurate numbers as early as you can”.

Senior Manager, Supply Chain Planning,
Multi-National Branded Grocery Manufacturer, E

In forecasting, there is evidence of more collaborative integrated planning on exceptional issues to a greater extent than the routine every day repeated processes. Exceptional issues include seasonal uplifts in sales or promotions.

“Promotions are planned collaboratively months and sometimes years in advance with our customers”.

Customer Supply Manager,
Multi-National Branded Grocery Manufacturer, D

“Some of the issues here might be induced by ourselves – inaccurate forecasts – poorly planned promotions etc. That is why we are keen on collaboration for planning, forecasting and replenishing promotional events.”

Supply Chain Director – Ambient Goods,
Major UK based Grocery Retailer, A

“Forecasting has improved considerably. It used to be only about 25% accurate. Now it is a lot better. If there are a lot of events then there is no continuity which makes forecasting very difficult.”

Senior Category Manager,
Major European based Grocery Manufacturer operating in UK, F

“We spend a lot of time with suppliers attempting to improve the accuracy of promotions’ forecasting. Forecasts are developed jointly between each of our

principal retail customers and the suppliers and are based on a wide range of information from historical promotions such as what was sold, what the offer was (BOGOFF, 3 for 2 etc) and what the feature space was (end of aisle, floor stacks, just the shelf).”

Category Manager,
Soft Drinks Manufacturer UK, C

In addition, a great deal of effort is placed on ensuring the build up to a promotion and the ramping down after it is handled in a planned and cohesive manner.

“We have to work closely with the retailers on escalation and de-escalation plans”

Senior Category Manager,
Major European based Grocery Manufacturer operating in UK, E

In summary, great effort is placed on aiming to generate and agree accurate forecasts to aid predictability, and this manifests itself as a core activity of any Buyer – Seller relationship in the industry.

- Sharing of Information

One of the changes brought about by developments in the Internet and electronic commerce is the increased sharing of information between buyers and sellers of product information which underpins the focus on improved predictability.

“What has changed is the level of collaborative information that is interchanged between retailers and us. The key issue here is how to grapple with it and understand it, and what to use the data for... so for instance we can look at sales through the retailer’s information exchange system, but this information is inappropriate for order quantities. We use it more as an early warning mechanism.”

Customer Supply Manager,
Multi-National Branded Grocery Manufacturer, D

The sharing of information is beginning to occur over more than one echelon in the supply chain. For example, one leading manufacturer is planning the capability to share packaging information along its whole supply chain with suppliers and retailers.

“In essence there has been no change in the last ten years.

The Internet has not come in to replace EDI. But the future might change and the catalyst for the change might be ASDA Wal-Mart. We anticipate that they will envision that every one of their suppliers will have EDI link with them through the Internet. They are the leaders in thinking about how web-based systems could help suppliers and the retailer look at the same data on promotions and better understand their position collaboratively.”

Customer Supply Manager,
Multi-National Branded Grocery Manufacturer, D

Predictability at a fairly granulated level is an important capability, and developments in collaborative planning focus, statistical techniques and joint management of exceptional events and activities are resulting in some improvements. Set against this is the extension of supply links as many manufacturers across Europe consolidate production from a principally nationally focussed strategy to a pan-European philosophy. This has been an evolving factor facilitated especially by the Maastricht Treaty in 1992 which freed up trade movements across Europe creating the Free Trade Zone.

“From this one factory, located reasonably centrally near the French/Swiss border, we produce supply of this branded product for the whole of our European market”

Supply Chain Director
Major European based Grocery Manufacturer operating in UK, E

4.3.1.2 Velocity

- Pressure on Improving Stock Turn Round Rates

Connected to the predictability issues inherent in forecasting accuracy is stock turn round rates. Many of the retail customers in the grocery sector are actively reducing the number of day's cover of inventory in their distribution centres and stores. Primarily this is due to a desire to reduce capital tied up in stock, but it is also due to the widening of catalogues (this causes pressure especially on warehouse space at the distribution centres) and the move to continuous replenishment by many of the

retailers, where the capability to place a main order on every product once a day (and on some products twice a day) has been phased in. For instance, Table 12 shows the stock cover of a major soft drinks supplier by one of the “Big Four” UK retailers in their distribution system. It highlights the tightness of the total stocks and the fact that each year this figure is pushed downwards.

	Soft Drinks Average	Major Soft Drinks Manufacturer
2002	1.05 weeks	1.01 weeks
2003	0.97 weeks	0.93 weeks
2004 (17 weeks)	0.94 weeks	0.87 weeks

Table 12: Stock cover of a major soft drinks supplier at one of the “Big Four” retailers.

“Store orders are received once a day for each product.”

Senior Supply Chain Manager,
Major US based Grocery Retailer operating in UK, B

“If you are able to receive a delivery once/twice a day why hold days or weeks of stock in store this challenges downwards on pack size and will be increasingly common. For example, in cosmetics pack size went from six to three to single item picks”

Senior Supply Chain Manager,
Major US based Grocery Retailer operating in UK, B

This again is an indication that retailers are keen to reduce stock holding in the store.

“The Euro pallet has now been introduced for all flow through juice lines (last year on full pallets). The advantage of the Euro pallet, which is about half the size of a normal pallet (there are 30 cases on a Euro), is because it is a smaller unit

- *more stores can therefore have them*
- *they can be more continuously replaced*
- *they enable lower stock holding levels in the store*
- *like the pallet flow through they can flow through the distribution system”*

Senior Supply Chain Manager,
Major US based Grocery Retailer operating in UK, B

This is indicative of the increasing focus by retailers to encourage more flow through designed packaging, especially for their high volume lines – so called shelf ready packaging. The Euro pallet products for one retailer are sent through the ambient system, but not binned in the racking and stored like conventional ambient products. Instead they are cross-docked at the warehouse and are picked to zero like the chilled system. The ideal even for a pushed product is more integrated production in step with demand.

“Product X” is probably the nearest to being made at one with demand rates. It is shipped on Tesco dollies – also seasonally this happens with “product Y” and also with “product Z”.

Supply Chain Manager,
Major European based Grocery Manufacturer operating in UK, E

Again there is a link with collaborative forecasting

“Another example of working together is on MUs (merchandisable units) – important to get the right size for the rate of sale”

Category Manager,
Soft Drinks Manufacturer UK, C

4.3.1.3 Reliability

Process reliability across the range of activities that can potentially span the Buyer – Seller interface is very important in the grocery sector.

*“Our Mission is Best Value, Our Purpose is Most Approachable, Our Values are Respect for the Individual, Best Customer Service and to Strive for Excellence.
In order to achieve these we need reliable processes”*

Senior Supply Chain Manager,
Major US based Grocery Retailer operating in UK, B

Some regularly demanded products are produced, shipped and delivered in step with demand. This calls for high reliability in terms of all processes including delivery. However, for many products, peaks are too steep to manage like this and as a consequence stocks have to be built up on forecasts and only the residual surges can be managed on a more reactive basis.

“We manage highly seasonal products with sales coming in big waves, especially at Easter and Christmas. So stock is made up to seven months in advance – up to 100,000 pallets need to be stored”

Distribution Planning Manager,
Major European based Grocery Manufacturer operating in UK, E

4.3.1.4 Reactivity

Retail customers also are increasingly demanding that their suppliers have developed capabilities to be able to react when actual events are misaligned from forecasts. As a consequence, a focus of collaborative work is in developing early warning systems to alert practitioners when forecasts are being missed (especially on exceptional events like promotions where the difference can be substantial). Secondly, emphasis is also placed on developing an ability to respond, although there is a certain level of frustration here.

“manufacturers classically do not invest enough inventory early enough to allow for stores to create impact to launch an event and do not have the capability to react – increasing or lowering production – to allow for a comfortable landing at the end of the promotioninterestingly, we (the retailer) now can provide an accurate insight into the shape of the promotion in sales terms from the feedback from the first day’s sale. Reactivity – is the key.

There is no prize for us (the retailer) in surprising suppliers”

Supply Chain Director – Ambient Goods
– Major UK based Grocery Retailer, A

It is not just reactivity in terms of the capability to respond when events are different to plan which retailers’ prize. It is also an ability to accommodate shorter planning

windows for promotions to react when overall sales need boosting or there is a particular marketing opportunity which emerges.

“The length of the lead time is shown by the planning for a promotion in February 2006. We have needed to button down the forecast by the end of November 2005. But the retailer customers are now asking for a tighter and tighter time for planning of promotions – ASDA can now work for a 4-6 week lead time. This is a shorter time than we can respond! Generally run promotions on a WIGIG basis – when its gone it is gone.”

Category Manager,
Major European based Grocery Manufacturer operating in UK, E

4.3.1.5 Conclusions Buyer – Seller Relationship

The desire to improve still further in this highly competitive climate for all players is clearly highly pertinent.

“Question - what is the future network of tools and processes to produce assured order to delivery results – how do we flex the system to ensure this? What will the supply chain manufacturers in the future look like to be efficient? What is the critical path here regardless of the type of product?”

Supply Chain Director – Ambient Goods,
Major UK based Grocery Retailer, A

The Buyer – Seller relationship is clearly the primary relationship in the logistics triad in the case of the grocery sector. It is driven by the over-arching strategy for each product category. Logistics – being one of the processes which services this, is a secondary support activity driven by needs of the category strategy –

“The category strategy is 3-5 year plan. It provides the direction for the brand, how we get it to the market, and how we drive it above the bottom line. We also consider what does this mean for our customers e.g. the principal retailers. We work with the principal retailers from about two years out.”

Senior Category Manager,
Major European based Grocery Manufacturer operating in UK, E

This means to a large extent it is the strategic marketing campaign which drives actions across the buyer – seller interface. This covers product development issues which do not directly concern logistics provision like developing brands and product categories etc.

“The key issues we are looking at with the retailer customer are the ready to drink market, tetra packs, innovations, healthy living etc. We also looking at fat reduced products lowering sugar content – need to look how this affects our brands”

Senior Category Manager,
Major European based Grocery Manufacturer operating in UK, E

Business plans are then drawn up which determine the allocation of funds and where action is prioritised.

“This all drops into the business plan. This is where we put numbers against it and put forward a first P&L. The business teams will then determine how much investment goes behind each category”

Senior Category Manager,
Major European based Grocery Manufacturer operating in UK, E

Issues are then managed more by exception – i.e. where events are not occurring as planned. If a process is going to plan then less attention is given to it – if there are concerns then this attracts more managerial attention.

“A list of issues for performance divergence against plan will be produced and the team will work to try and pin down a reason for this”

Senior Category Manager,
Major European based Grocery Manufacturer operating in UK, E

A summary of the work that flows from this over a typical year is as follows:

1. *“Plan – 12 months for the next year – usually in tonnes*
2. *Breakdown by month – split into base and + or – for an event*

3. *Road show – Demand and Customer team review at customer level how we are performing*
4. *Monthly Forecast Review (MFR) review the next month and the month after. All the numbers are reviewed based on that*
5. *Every quarter a revised annual figure is produced – March, July and September which lead to formal reviews which are fed ultimately to the stock market”*

Senior Category Manager,
Major European based Grocery Manufacturer operating in UK, E

Complexity is brought in by:

1. *“Events*
2. *New product launches*
3. *The lengthy lead time – exacerbated by working with a factory in France*
4. *Other factors*

There then follows a scramble to hit the operating plan.”

Senior Category Manager,
Major European based Grocery Manufacturer operating in UK, E

In conclusion, it is clear that the supply chain is increasingly becoming an important area in the grocery sector. It can be confirmed from this feedback that the logistics element of the Buyer – Seller relationship is only one of many interfacing activities that form the basis of the inter-relationship between the two entities. These activities range from highly strategic five year plans to tactical decisions about promotion activity to operational concerns such as each process is conducted with reliability. Indeed, it confirms in many ways that logistics is a relatively small proportion of the total interface activity. This is especially the case when logistics activities, which tend to be fairly routine, go to plan, as more time and effort is devoted to activities and processes which fall behind expectation.

4.3.2 Relationship Two: The Shipper – LSP Relationship

“We serve a wide range of general haulage customers. The most demanding customers are the large grocery retailers. For example Tesco and Sainsbury’s who insist on deliveries on time consistently and reliably.”

Managing Director,
Leading Logistics Services Company, J

This comment, although anecdotal, is not uncommon among logistics service providers interviewed or heard from. The standards expected and demanded by retailers and manufacturers are consistently high. One logistics service provider contrasted this situation with what is required from General Haulage.

“This area of business (the grocery sector) accounts for 20% of deliveries but 80% of the effort. The key is to ensure you do not miss the 30 minute late window! So we need dedicated trucks to guarantee the deliveries for these customers.

The rest of the business compliments this and usually provides us with a little more flexibility. Service terms are generally not so exacting”

Managing Director,
Leading Logistics Services Company, J

The industry has seen an increasing level of outsourcing of logistics in recent decades.

*“For customer deliveries now only about 5% are own fleet
- used to be 90% 10 years ago (95% is now carried by 3rd party).*

One of the driving factors has been the cost to employ – for a blue chip company this is often higher than offered in out-sourced 3PL’s so money is saved without compromising on what the company stands for.”

Head of Transport Services,
Major European based Grocery Manufacturer operating in UK, E

In this section the logistics service operation in the grocery sector is examined under the same headings: predictability, velocity, reliability and reactivity. The issues raised

are then discussed in light of the inter-relationship between the logistics service provider and their shipper clients.

4.3.2.1 Predictability

From the literature review we note that logistics requirements must be planned as accurately as possible, not just on a monthly basis but also at a micro level on a daily if not hourly rate. One of the issues which surround logistics is that this more detailed planning invariably has to take place in quite tight planning windows – which appear in some instances to be getting tighter and also are quite hard to predict. As planning windows for logistics provision are becoming shorter, this places an imperative on software support to help plan the use of distribution assets efficiently and effectively.

This impacts warehousing and transport provision:

“First part of the process is the weekly forecast – the number of deliveries expected from each production site – production is very much pushed onto the DC’s and the forecasts are invariably inaccurate – i.e. we receive more of what we do not want and not enough of what is required.”

Warehouse Manager,
Major European based Grocery Manufacturer operating in UK, E

“One of the big issues is the unpredictability of demand. Predicting the when and where the high volume will be is very difficult. However, the traffic offices are very skilled at being able to handle this and can manage this skilfully on a day to day and minute to minute basis to get the most optimal solutions.”

Managing Director,
Leading Logistics Services Company, J

“Our biggest issue is the unpredictability of orders by day. Over the week orders average themselves out and are fairly predictable, but by day there often unforeseeable amplifications, which make it very difficult for accurate manpower planning.”

Warehouse Manager,
Major European based Grocery Manufacturer operating in UK, E

“Time windows for planning are becoming tighter. One major retail customer now wants day one order for day two delivery – 36 hours delivery from the time they placed the order (was 40hours)”.

Distribution Planning Manager,
Major European based Grocery Manufacturer operating in UK, E

The literature discussed the increasingly integrated nature of logistics within the supply chain framework. However, in many companies visited, logistics planning is devolved into separate departments than other inter-related supply chain functions such as purchasing or sales. It is also mostly managed at an operational level concerned with the basics of ensuring orders are picked and deliveries are organised and dispatched on time to meet the on-going delivery schedules of customers.

“One major retail customer orders on Day One for Day Three delivery. Orders placed on SAP and released to the local systems, which split it into separate vehicles, determined by what can travel with what. There is an incentive for full pallet (based on the fact that it takes longer to pick part pallets v full pallets – but this does not work for units of pallets – i.e. if order 1 ½ pallets will still get discount!) and full loads (if order 35 pallets or more – approx FTL as some product can double stack – 26 pallet footprint typical).”

Distribution Planning Manager,
Major European based Grocery Manufacturer operating in UK, E

“Anything that moves in the UK come through the scheduling team (does not include raw materials).

*Incentives to drive up trailer fill rate – target is 28.5 at main distribution centres
Generally, the team looks at orders and tries to bring them together – so for instance linking up to 3-4 drops per delivery where there is spare capacity.”*

Transport Scheduling Manager,
Major European based Grocery Manufacturer operating in UK, E

4.3.2.2 Velocity

Although the literature review stated that time compression was an important issue in modern SCM, another associated and over-riding issue which will be discussed more

fully in the next section (that of reliability) appeared to be a more important service quality criteria which was demanded by customers and aspired to by suppliers and service providers. Moreover, there was evidence that logistics services were used to some degree as a buffer for other supply chain services, as the over-riding concern was for the supply chain to run smoothly with no hiccups rather than optimally.

“In the supply chain we have two principal focuses – to ensure the factories and the deliveries to customers operate smoothly. Consequently transport and warehouse management are arguably not managed so tightly – trucks are not as full as they might be or are left waiting at warehouses.”

Head of Transport Services,
Major European based Grocery Manufacturer operating in UK, E

That is not to say there were not many examples of systems where stock flowed through the distribution system fairly rapidly – tinned confectionary assortments only 3 days old were on the retail shelf in one quoted example. In addition the move to smaller order quantities (with further proposals being considered) is impacting on the associated issue of delivery frequency.

“Retailers, even the larger ones have indicated that they will move more to ordering by case in the future – what are the implications for the system?”

Customer Supply Manager,
Multi-National Branded Grocery Manufacturer, D

4.3.2.3 Reliability

As inventory levels are tightened this kind of pressure in the supply system puts more emphasis on reliability of delivery. This appears to be one of the most critical reasons why logistics provision has increased in importance.

“Product availability at the DC is critically important. As a retailer we pressurise inventory levels down in DCs and stores. They are more vulnerable to poor delivery levels from supplier base. Therefore the key aim is to ensure delivery from suppliers is on time and in full. FTA – failure to arrive – is very closely monitored and followed

through with suppliers. Aim is for suppliers to deliver 100% of order 100% of the time”.

Supply Chain Director – Ambient Goods
- Major UK based Grocery Retailer, A

“On ambient currently getting 97.5% OTIF (On Time in Full) delivery results from suppliers – later said 5% of orders from suppliers do not turn up – 60% of suppliers deliver less than 90% of what we want (OTIF)”

Supply Chain Director – Ambient Goods
- Major UK based Grocery Retailer, A

“Delivery on time is becoming tighter. Before, if late they would take it in. There would be a cost to the relationship with the customer, but no actual lost sale. Now with stockless distribution if you miss the “wave” of DC picking then there are real missed sales on the supermarket shelf.”

Distribution Manager,
Major European based Grocery Manufacturer operating in UK, E

“Time windows for delivery have not changed. Still given a +/- 30 minute window. If late then there are penalties.”

Supply Chain Director,
UK Leading Soft Drinks Manufacturer Subsidiary, C

“Our OTIF (on time in full) measure is + or – 30 minutes”

Head of Transport Services,
Major European based Grocery Manufacturer operating in UK, E

“Delivery window remains at +/- 0-30 minutes with our customers. However, now get punished if we are early as well as late with one customer!”

Distribution Manager,
Major European based Grocery Manufacturer operating in UK, E

In many ways this supports the findings of Zsidisin et al (2007) in the literature review, which finds that reliability of delivery is no longer seen as an order winning

criteria but as an order qualifier, if Hill's (1985) terms are used. The supply chain system is maturing to such an extent that all logistics service providers, to be deemed competent, must be able to deliver reliably to the delivery window in the grocery sector irrespective of their partnering status with their shipper client.

This raises an interesting notion about partnership. If there is not a strong correlation between improved service in terms of delivery reliability and partnering status, does this remove one of the key reasons academic authors had previously cited for partnering?

The importance of reliability of delivery performance is observed also in this discussion about performance measurement for logistics at one manufacturer.

“There is KPI (key performance indicator) tension between a customer service measure – (the delivery must go now!) and the efficiency measure (need a fuller vehicle before dispatch agreed – can scheduling work out a fuller load). There is some negotiation but in the end the service measure is the priority measure!”

Transport Scheduling Manager,
Major European based Grocery Manufacturer operating in UK, E

This is interesting because it adds support to Skjøtt-Larsen's (2000) point that there is a change in value requirements in this relationship which have evolved. Whilst competitive cost containment is still actively sought it is not the sole, nor arguably always the dominant value criteria, with other aspects such as improving the level of service or increasing flexibility capability towards changing customer requirements, being more in demand. This supports the notion that in inter-dependent supply chains where inventories are run more tightly and lead times are compressed down (typical of the scenario that has been found in the grocery sector), the service reliability of freight transport provision becomes a balancing trade off with cost containment in the value equation (see Johansson et al, 1993, Figure 42).

4.3.2.4 Reactivity

Zsidisin et al (2007) concluded that the order winning criteria which was most associated with a more partnering arrangement between the Shipper and the LSP was

their ability to accommodate uncertainties. In particular, the capability to be able to respond reliably during periods of peak demand was prized. Therefore, it would appear that building in the capability to be able to react proficiently to accommodate such uncertainties is a critical capability in both transport and warehousing.

“There are lines that are in very short supply. It means that we often have to fast track stock which is desperately required by customers through the DC when it is received from factories”

Warehouse Manager,
Major European based Grocery Manufacturer operating in UK, E

“The unpredictability of orders by day places a premium on flexible arrangements, such as annualised hours contracts”

Warehouse Manager,
Major European based Grocery Manufacturer operating in UK, E

4.3.2.5 Conclusions

A number of factors should be drawn from this section:

- Δ The grocery sector is a demanding sector in terms of logistics - the base standard for logistics is more exacting than in many other sectors;
- Δ Criteria for partnering is moving – operational ability to consistently deliver on time is now not enough to win contracts or sustain orders – this is a qualifying issue - other criteria such as an ability to respond or react is seen to be a more important virtue in terms of winning contracts;
- Δ Logistics competence for suppliers plays a critical role – yes – but this is now built into expectations – it is an order qualifier not an order winner;
- Δ Operationally logistics invariably is managed discretely to other supply chain activities – it is a supporting service;
- Δ Cost is still important – but effective attributes also valued

4.3.3 Relationship Three: The LSP – Consignee Relationship

In the grocery sector in the Buyer – Seller interface between the manufacturer and the retailer, there has been a shift of accountability in terms of logistics in many instances in recent years. This has come about due to what has become known as the Factory Gate Pricing Initiative. In summary this is where, rather than the manufacturer arranging for the transportation of demanded product to the retailer, the retailer instead takes accountability for this activity. In so doing, rather than paying for an aggregated price of product plus transport to the manufacturing supplier, the retailer only pays now for the finished product as it leaves the “factory gate”.

In the grocery sector in the UK, the first move towards FGP was announced by Tesco in 2001. Subsequently, their lead was followed by other retailers (for example, Sainsbury’s). FGP in the grocery sector provides a single point of control for the inbound network and is defined as “*the use of an ex-works price for a product and the organisation and optimisation of transport by the purchaser to the point of delivery*” (Potter et al, 2007). The buyer takes control of the transport of the goods from the supplier, and aims to make the best use of the available vehicle fleet.

The purpose of FGP is to reduce empty running, increase average lorry fill rates and to improve in-bound visibility and on time service levels. The move to more continuous replenishment combined with reduced inventories of each product in the retailers’ distribution systems had resulted in a reduction in average shipment size combined with an increase in the frequency of shipments. Various ad-hoc arrangements had been developed through the 1990s by manufacturing suppliers to combat this problem by consolidating deliveries together through horizontal collaboration with, in effect, their competitors. The introduction of FGP was combined with the creation of a new network of consolidation centres now managed by the in-bound retailer where all less than truck load manufacturer to distribution centre deliveries were amalgamated so that on the longer trunk leg to the distribution centre, the fill rate is better optimised.

A further benefit to the retailer was the capability to generate a greater insight into the behaviour of its replenishment processes in response to changes in demand.

Therefore, excessive amplification of customer demand can be identified, and the root causes of this addressed.

As a result Relationship 3 moves in reverse from the LSP - Buyer position to the LSP – Seller in many instances, although in some cases, notably some of the larger suppliers who can still consolidate deliveries of their own product or who have their own consolidated and integrated network, this change does not occur.

In summary, there is little evidence of the formation of any meaningful relationship or mutually beneficial behaviour on this non-contract based third relationship. For instance there are no occasions where there is any hint of any accommodation of flexible delivery arrangements in terms of a longer delivery window. In addition, anecdotal stories of waiting issues at distribution centres (interestingly for shipments organised by the retailer and the manufacturer) are frequently reported.

There is a slightly different story where the LSP link connects two echelons of the same company – for example the in-bound logistics leg from distribution centres to stores. Here there are instances of sub-optimal behaviour by one party which can lead to better optimised total store order and delivery system. This can be illustrated well by Tesco's pick by aisle policy so that product is delivered to stores already sorted into pallets or cages of ambient stock sorted into relevant aisle locations.

A further example of this is, this time with implications further down the supply chain than just the logistics triad, the big drive to place fast moving products on wheels (cages or dollies) – discussed above - and the initiatives to develop and adopt new shelf ready packaging systems.

For smaller neighbourhood stores especially, a growing format in recent years as customers become more attracted to convenience store shopping is the synchronising of deliveries with filling teams' rotas. Isotrak pagers give early warning of arrival of deliveries so teams can prepare to accept and off-load the delivery without delay.

In summary, little formalised inter-relationship along this third relationship is noted with the exception of in-bound to store legs and inter-company legs where some evidence is apparent.

4.3.4 Relationship Four: The Tripartite Relationship across the Logistics Triad

It is perhaps therefore unsurprising to hear that there is also little evidence of relationships being developed across the triad amongst all three members in grocery sector logistics triads. A few players report that there are “periodic” meetings involving all three parties “sitting down together”, but overall this kind of feedback is rare and if meetings across the triad do take place they are very periodic.

“On a tripartite basis we have occasionally sat in on meetings between our manufacturing client or and a major retailer customer. However, this has been only very occasional and at the instigation of their customer and we do not see itself as the leader in this environment.”

Managing Director,
Leading Logistics Services Company, J

“Occasionally we have attended a tripartite meeting between ourselves the logistics service provider and one of our retail customers.....but these kind of meetings are only arranged on a very ad-hoc basisthere has only been two or three of this type of meeting”

Category Manager,
Multi-National Branded Grocery Manufacturer – UK Operation, K

A possible explanation of this was gleaned from an interview with the Marketing and Strategy Director of one of the UK’s leading logistics service provider companies.

An Institute of Grocery Distribution (IGD) facilitated workshop had been arranged in 2007 focussing on the environmental impact of distribution and had centred on an issue which asked participants how they could better collaborate to improve environmental impact scores.

“Representatives from 3PLs were invited to come along (NB. Logistics service providers not welcomed as members of IGD!) Each logistics service provider was asked to present their stance on the environment - a common theme was which the IGD promoted was the need to collaborate – however this flew in the face of the atmosphere of the day which treated the logistics service providers as “second class citizens” – they were not included as equal partners on the day and after their presentations were politely asked to leave!”

Strategy and Marketing Director,
Leading UK Based Logistics Service Provider, I

This is interesting as it confirms the theory that even quite large LSPs are not considered as equals across the logistics triad buyer-seller entities. Indeed, it means that any optimism of operating more effectively in an aligned manner across the triad in the grocery sector cannot realistically occur without a major shift in the foundations of culture and power across the triad. Indeed, “Control, Power and Collaboration” was the title of a presentation at a subsequent IGD conference in November 2007 where the lack of joined up thinking across the logistics triad was asserted using this example.

However, there does appear to be some drivers for change which may be encouraging more focus on the logistics triad.

The first issue is the environment – the logistics industry is under pressure to show that it is taking seriously the environmental challenges. It is increasingly being recognised in the industry that through adopting a collaborative approach and seeking holistically acceptable answers, best progress will be made. This is not just on emissions control and reducing carbon footprints. For instance, the charges linked to the disposal of waste material to landfill are on a tax escalator and are consequently becoming increasingly expensive. Any initiatives to reduce packaging waste are therefore welcomed. It is in more effectively managing the industrial network of logistics provision, which requires partnerships and collaboration that may prompt actors across the logistics triad to work more closely together. The recent press coverage of leading retail manufacturers and retailers in the UK getting together to

develop network synergies sponsored by the Institute of Grocery Distribution (IGD) is a good example of this (Daily Telegraph, 2008).

Secondly, the competitive pressures continue to intensify and any missed opportunity to improve values may well be sought. It is interesting to note one change at one of the retailers

“A small, but highly significant change has occurred in the KPI system.

*The buyers, previously accountable for gross margin
are now accountable for net margin.*

This means that a product such as the Capri pouch, which suffered from very high levels of damage, which considerably impacted on net margin is suddenly of interest to the buyer.

The buyer needs to be interested in setting the product up properly.

There is a big cultural shift to be overcome and much training and development of attitudes, but could lead to more joined up thinking in managing supply chain issues”

Senior Supply Chain Manager,
Major US based Grocery Retailer operating in UK, B

4.3.5 Conclusions

As in the steel sector inductive study to provide a categorical indication of the SCM qualities an analysis of the narrative feedback was carried out. Again to achieve this, an indicative and subjective categorical description was given for the sector's SCM practice focussing upon the four nominated categories of desirable supply chain qualities (predictability, velocity, reliability and reactivity). The results were as follows and are presented in Table 13.

Desirable Supply Chain Qualities	Subjective categorisation of SCM qualities in the sector based on the narrative perceptions presented		Justification (derived from transcript perceptions presented above)
	Summary	Indicative Category Rating	
Predictability <i>The degree of forecast accuracy</i>	This is an area which has seen marked improvement in recent years – this has been driven by a greater willingness to share information and buyers and sellers working together to plan events such as promotions and seasonal uplifts. There are still issues around predictability of demand however.	Medium	“We have to work closely with the retailers on escalation and de-escalation plans” “Predicting when and where the high volume will be is very difficult”
Velocity <i>Improved inventory turns per year, or tightening the number of days of inventory on hand</i>	There has been an on-going pressure on inventory turnover rates especially at the retail end of the chain. Stocks held at DCs and stores are a few days cover rather than weeks. There are even suggestions that retailers will order by case rather than pallet in the future from manufacturers	Medium/ High	“If you are able to receive a delivery once or twice a day why hold days or weeks of stock?” “the challenges downwards in pack size are incessant ...in cosmetics it went from 6 to 3 to single item picks”
Reliability <i>Reduced variability of shipment times around the mean transit time</i>	The sector is extremely competitive. The drive for value from the ultimate customer’s perspective has led to the quest for ultra-reliability in supply chain processes including logistics	High	“Our mission is best value – in order achieve this we need reliable processes”
Reactivity <i>The ease of accommodating special requests</i>	Even with the best planning things do not go as forecast and therefore the capability to be flexible in actively sought from supply chain partners and service providers	Medium	“ <i>The unpredictability of orders by day places a premium on flexible arrangements</i> ” “ <i>Reactivity is the key</i> ”

Table 13: Categorising table showing indicative ratings of desirable SCM qualities from grocery practitioners presented in the inductive study

As in the steel sector inductive study, to provide further credence to Table 13 a pattern matching analysis of the narrative feedback was carried out. Again, to achieve this, a simple subjective scoring of high, medium or low was apportioned to each of the quotes above in terms of the four nominated categories of desirable supply chain qualities (predictability, velocity, reliability and reactivity). The results were as follows and are presented in Table 14.

<i>Desirable Supply Chain Qualities</i>	<i>Classification of grocery practitioners' views of the grocery sector supply chain capabilities, as presented in the inductive study (based on a high, medium and low scoring system)</i>		
	High	Medium	Low
<i>Predictability</i>	1 (D), 1 (A), 1 (E), 1 (D), 1 (E), 1 (F)	1 (D), 1 (E), 1 (A), 1 (E), 1 (E), 1 (J)	1 (E), 1 (E)
<i>Velocity</i>	1 (B), 1 (B), 1 (B), 1 (B),	1 (D), 1 (E), 1 (E)	
<i>Reliability</i>	1 (E), 1 (B), 1 (J), 1 (J)	1 (E),	
<i>Reactivity</i>	1 (A), 1 (E), 1 (E), 1 (E)	1 (A), 1 (E)	

Table 14: Pattern Matching Table Showing the Spread of Quotations from Grocery Practitioners Presented in the Inductive Study.

These results provide further evidence that the qualities desirable in effective SCM are more advanced in the grocery sector than the steel sector. This is highlighted when the summary category descriptions are directly compared (Table 15).

<i>Desirable Supply Chain Qualities</i>	<i>Comparative Summary of Subjective Indicative Categorisation of Supply Chain Capability against Desirable Supply Chain Qualities Derived from the Inductive Study from the Steel and Grocery Sectors</i>	
	Steel	Grocery
<i>Predictability</i> <i>The degree of forecast accuracy</i>	Low	Medium
<i>Velocity</i> <i>Improved inventory turns per year, or tightening the number of days of inventory on hand</i>	Low/Medium	Medium/High
<i>Reliability</i> <i>Reduced variability of shipment times around the mean transit time</i>	Low	High
<i>Reactivity</i> <i>The ease of accommodating special requests</i>	Low	Medium

Table 15: Comparative Summary of the Subjective Indicative Category Ratings for the Desirable Supply Chain Qualities from the Steel and Grocery Sectors

In the grocery sector more emphasis is placed on predictability, velocity, reliability and reactivity by the Buyers and Sellers and capabilities in each of the four areas is also greater. Inventory levels are lower, stock turns are consequently higher and a more integrated and synchronised supply chain system is clearly evident compared to the steel sector, with subsequently greater emphasis on accurate predictability, increased velocity, greater reliability, and enhanced emphasis on reactivity capability. This is all driven by a competitive quest to deliver value enhancements through process competences primarily for the benefit of the ultimate consumer.

This does place extra pressures on LSPs. LSPs need in turn to be able to provide service which demonstrates capabilities in each of the areas as well. However, the

logistics triad would appear to be a largely untapped area in the grocery sector and the third relationship a potential weak link in the grocery supply chain. This is perhaps strange in a supply chain more notable for its closer integration. Two pertinent explanatory areas which emerged during the inductive study centre on cultural and structural factors.

4.3.5.1 Culture

The logistics company is seen as a servant to the primary Buyer – Seller inter-relationship and is not treated on equal terms in many instances. Certainly it is not perceived as the leader of the supply chain or in a position to instigate change – they are forced into a follower role. This is endorsed by the Strategy and Marketing Director of one of the main UK based logistics companies who states....

“Collaboration (across the triad) could only be achieved where there is a true spirit of equals – currently, the state of the relations are a product of the environment which they (most of the big multiples and the multi-national grocery producers) have created where the logistics service providers are treated differently” – similarly to level 1 (transactional based relationship) in the spectrum of inter-relationship types.

Strategy and Marketing Director,
Leading UK Based Logistics Service Provider, I

When asked to explain the fundamental causes of this situation he continued...

“The root of this attitude stemmed from the needs of many of the main actors in this environment to “exercise control” over many aspects of their business – logistics service providers such as ourselves are not invited to organise, facilitate or even participate in the design of their supply chains or the quality of their systems – only to respond – those that can do so effectively at the cheapest rate win out. This is the world that has been created and it is not conducive to a spirit of collaboration which they say is now what they want.....

The key is the difficulty many players would have in losing control - this is a mind-set problem we have which is preventing opportunities from being grasped”.

Strategy and Marketing Director,
Leading UK Based Logistics Service Provider, I

4.3.5.2 Structure

The second driver to this conclusion of why the logistics triad has not become more developed in the grocery sector, is to do with how logistics provision is now structured. It has certainly evolved considerably over the last few years. Up to the end of the 1990's in the UK, logistics provision mostly centred around dedicated fleet providers. Now the market is dominated by more flexible sub-contractors, with dedicated fleets restricted to situations where specialised fleet requirements are demanded. Creating demand synergies for the use of logistics assets such as warehouse space or vehicle utilisation has become vital in winning contracts because it allows costs to be reduced compared to the old dedicated scenario where (for example) trucks remained idle when not needed by the customer.

“Utilisation of the assets is a key.

Need to understand overall peaks – so for example now (January) is a quiet time of year, but in the build up to Easter it gets busier for customers such as Masterfoods and Sainsbury's. In the summer Carlsberg peaks out of Northampton. Our company develops an annual transport plan with the aim of evening out these peaks and troughs through the demand portfolio of customers we serve.”

Managing Director,

Leading Logistics Services Company, J

A number of these LSPs now work across general haulage, incorporating grocery logistics within their portfolios and balancing the demands made in this sector with the different demands (often less stringent) in other sectors. For example, one LSP interviewed maintained food contracts with core general haulage work such as kitchen/bathroom/MDF/white goods/etc. This is quite different to FMCG, much less sophisticated and characterised by: Mon – Fri daytime only mentality, wide delivery windows, seasonal/weekend shutdowns, long lead times, pay by delivery, and low back office support. This is in contrast to FMCG which has a 24/7 mentality, tightly defined and definitive delivery windows, no seasonal/weekend shutdowns, pay by pallet delivered, and intensive back office support.

Although having less dedicated and more multi-sector logistics has its advantages it has meant that the logistics operations in terms of the customer interface has become less clean. There may be many LSPs operating on certain routes. Also, not only are there many more carriers working on each logistics leg but there is also less room for “unofficial” work involving logistics carrier interaction and customer flexibility. The head of a major LSP gave this example to support this point.

“in the past a carrier might liaise with a customer and although a consignment note stipulated a certain delivery time /date an alternative delivery time would be agreed to provide the carrier with flexibility to work their schedules – this is no longer possible”

Head of Retail Solutions

– Leading Logistics Service Provider, H

(serving Sainsbury’s, The Home Group, B & Q, M & S, Scottish and Newcastle)

4.4 Inductive Study Reflections

What has become clear through this exploratory study is that the typical logistics company is very different to the customers they serve. As a consequence, managing relations between LSPs and their customers at just a dyadic level is fraught with difficulty. For example, a senior LSP director summarised the differences in a Table (Table 16) in comparing LSPs to their retailer customers:

In short, LSPs have to become better at tailoring their product offerings to match the needs of their customers, which can differ quite considerably as noted in the comparison of the steel and grocery sectors presented above. This fits in with Bask’s (2001) conclusion and Hertz and Alfredson’s (2003) typology of LSP types. One leading LSP has developed a four stage model to represent this spectrum of needs. This ranges from a core logistics service at the base end where the contract is predominantly transactional and price driven and where there is little attempt from the client’s perspective to mutually develop win-win solutions to, at the other extreme, a more inter-active partnership where more strategic goals are set – sometimes beyond

the scope traditionally associated with logistics provision such as increase of market share etc.

The Retailer	The LSP
Deals directly with the public	Business to business
Has many customers but no contracts	Few customers
Business is short lived	Business built on contracts
Business churn is short	Product develops gradually
Has to deal in emotion, magic and sentiment	Deal in operations
Has to take risks	Cautious, does not jeopardise the management fee
May not always place the supply chain at the heart of their business	Have supply chain operations at the heart of their business

Table 16: Differing Business Models between a Retailer and Logistics Company
 (Developed from a presentation given at Cardiff Business School by the Head of Retail Solutions, Leading Logistics Service Provider, H, serving Sainsbury’s, The Home Group, B & Q, M & S and Scottish and Newcastle)

Once the LSP has determined what kind of contract is required, work can start at operational, tactical and strategic levels based on requirements stipulated. In the short term this may involve the day to day operations for distribution – balancing work for the DCs, vehicle scheduling and planning. In the medium term there is more onus on responsible budgeting and in the long term strategy needs to be formulated in terms of improvements to lead times, managing in legislative changes, creating differentials to base competitive strategy upon and so on.

The logistics triad concept needs to fit into this framework. How it is managed and the importance it warrants will depend greatly on the supply chain strategy of the Shipper. Equally the LSP needs to be proactive enough to envisage it can make a difference and certainly the Consignee needs to be receptive and motivated enough to incorporate it into its way of managing.

It is perhaps inevitable that all three members of a logistics triad will have different aims. One leading LSP manager admitted that even in the dyadic relationship between the LSP and the Shipper this can be an issue, let alone in a three way relationship.

“The LSP and their customer invariably have very different aims”.

Head of Retail Solutions
Leading Logistics Service Provider, H

For example a third party will make a profit out of a relationship, a customer such as a retailer will not. He went on to suggest that,

“If the companies (the LSP and the customer) have different objectives in the relationship it is absolutely essential that they both;

- *Know what the objective is*
- *Agree what the objective is*

Agree and accept what the objective is”

Head of Retail Solutions
Leading Logistics Service Provider, H

These comments are very insightful and support the conclusion derived from the academic literature that there is a frustration among customers of LSPs that they do not innovate enough or take sufficient risks to develop improved future performance. Translating this empathetic approach to the logistics triad will be one of the principal challenges of the case study.

“Managing relationships even between a shipper and a logistics service provider can be very challenging as the shipper will not always have a uniform and united view of their organisations expectations of the logistics service provider. For instance – our company (Y)in undertaking work for Company X’s inbound supply chain all over the world found that key functions such as production, buying, logistics etc. all had different requirements and needs – so logistics relationship management is about managing the multiple client relationship even with one customer which can be very challenging!”

Marketing and Strategy Director,
Top 10 UK based Logistics Company, I

This problem of inter-relationship management can also be further compounded by natural churn of people. As discussed in the literature review all relationships have an element of social understanding in them (see Relationship Management Theory discussion) and hence the element of personal chemistry over and above any contract can be extremely important. However, people in organisations change roles and this can be disruptive to the collaborative partnership process.

“For example with Masterfood there was a very close relationship – but as people in organisations move on you lose these links and the collective knowledge and understanding that had been built up. The level of people churn in many organisations today is concerning for relationship development.”

Managing Director,
Leading Logistics Services Company, J

Where the partnership is across three organisations across the logistics triad the risk of “people churn” and therefore disruption is even greater.

4.5 Transport in Supply Chain Networks – Validating the Findings

To further validate the findings from this inductive exploratory study, a number of the issues emerging from it were asked as questions to an audience of professionals connected to the logistics industry in a dissemination conference in February 2008.

The methods of sampling used are covered in the Methodology Chapter but featured an innovative research method to gauge the audience’s feedback through an Interactive Response box.

The audience size for the conference was just under 100 delegates and the structure of the audience during the first morning session, when the presentation of the findings from this inductive exploratory research was presented by the author was as follows (Figure 44):

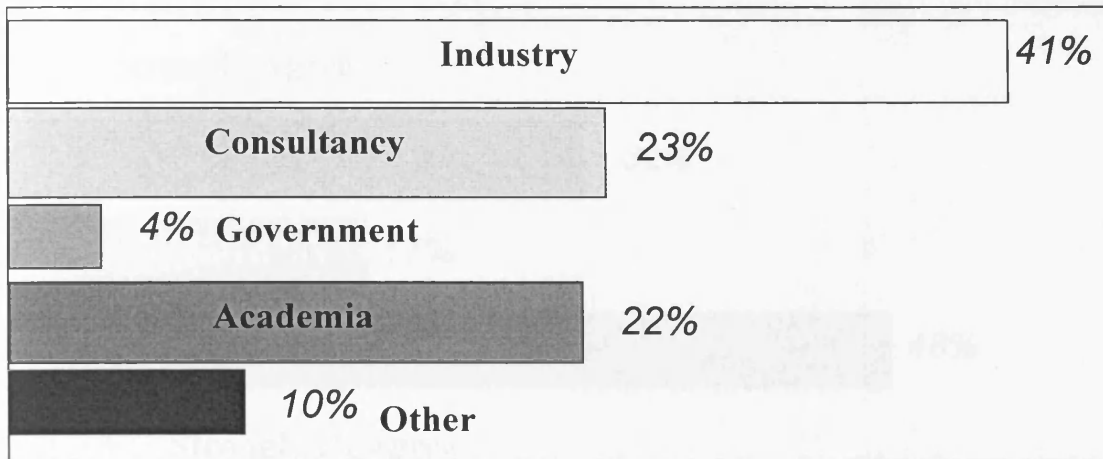


Figure 44: The Composition of the Audience at the first Morning Session of the Belfry Dissemination Conference – February 27th 2008

Those that had replied that they were from industry were then asked whether they were principally providers of logistics or customers of logistics – the following response was provided (Figure 45).

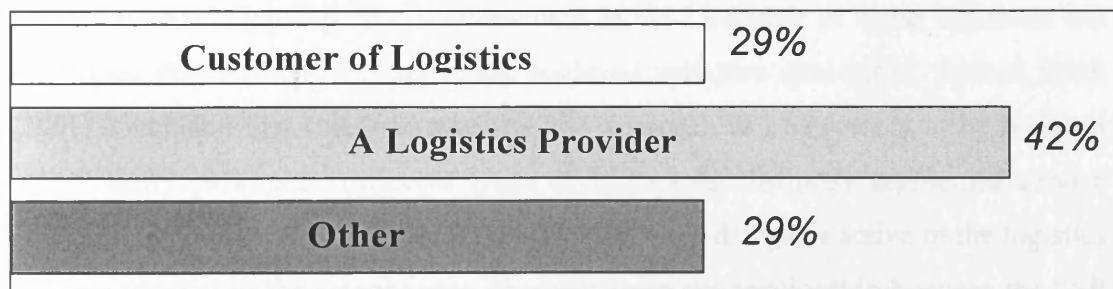


Figure 45: The Composition of the Logistics Industry Members from the Audience at the first Morning Session of the Belfry Dissemination Conference – February 27th 2008

The feedback from the industrial members (41 delegates) to each of the six questions is shown and the results discussed below. The first question which was asked was:

1. In your experience of logistics provision in the last few years do you feel that the type of relationship which exists between the logistics provider and the shipper is aligned to the overall supply chain strategy?

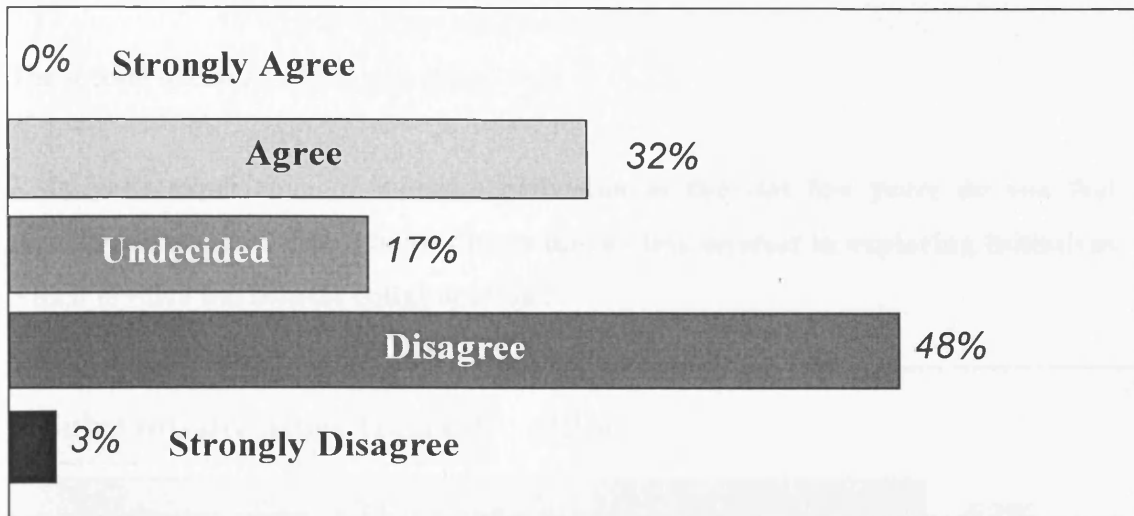


Figure 46: The type of relationship which exists between the logistics provider and the shipper is aligned to the overall supply chain strategy
 (Feedback from the Logistics Industry Members from the Audience at the 1st Morning Session of the Belfry Dissemination Conference – February 27th 2008)

This is an interesting finding in that a mixed result was returned. The alignment of strategy with relationship type was revealed in the Literature as being important but the degree that this was in fact being achieved was also questioned. Indeed, Bask (2001) concluded that the “one size fits all” approach to LSPs needs to be replaced with “clearly packaged” different types of LSPs with distinctly segmented service types and aligned relationship strategies. Only 32% of delegates active in the logistics industry felt that in their experience in recent years the relationship between the LSP and the Shipper was aligned to the overall supply chain strategy. The majority (a combined figure of 51%) disagreed or strongly disagreed that this was the case and 17% were undecided, indicating that still much work can be focussed on here to reap improvements.

When the breakdown of the results is assessed to gauge any differences between providers and customers of logistics, an interesting pattern is clear. Whilst the logistics providers feedback generally mirrors the overall average return, the customers of logistics return is much more skewed. Here 70% of customers disagree with the proposition and feel there is no alignment with strategy. There are clearly many reasons for this but the vote went against one of the principal findings from the Literature Review as discussed that there should be an alignment.

The second question which was asked was:

2. In your experience of logistics provision in the last few years do you feel logistics service providers have shown more / less interest in exploring initiatives which involve horizontal collaboration?

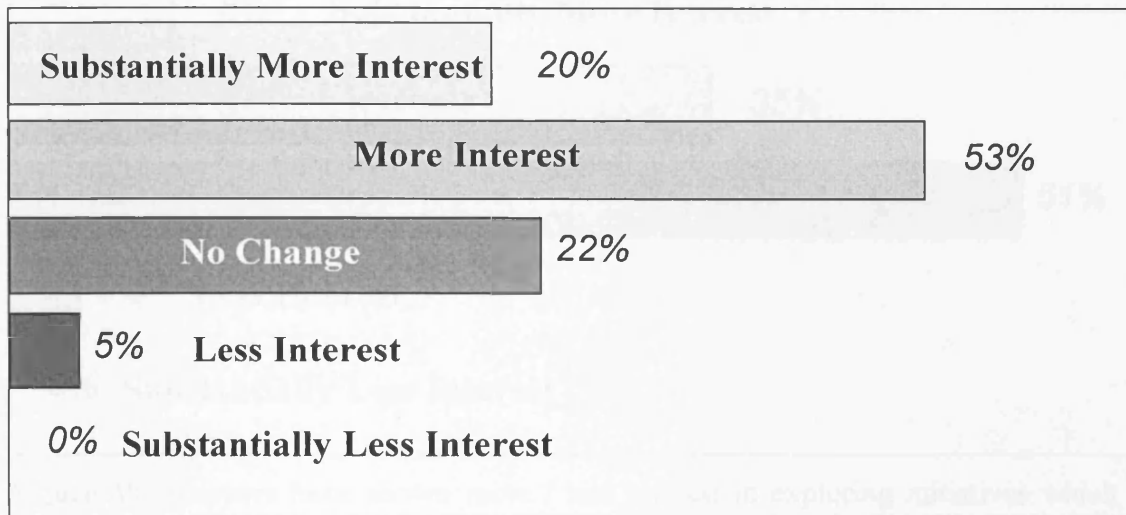


Figure 47: Logistics service providers have shown more / less interest in exploring initiatives which involve horizontal collaboration

(Feedback from the Logistics Industry Members from the Audience at the 1st Morning Session of the Belfry Dissemination Conference – February 27th 2008)

This question examined the phenomena that was noted in the Literature Review and also came through strongly in the exploratory study that LSPs in their search for value and improved asset utilisation synergies are actively looking for opportunities to operate across parallel supply chains. This is important as it confirms the view that the LSPs' aims in getting the best return on their assets to offer competitive services to their customers may be at odds to the Shipper's SCM strategy, which is to provide the highest value for their customer base. The LSP in short, if this conclusion is correct, is providing a less dedicated service than in previous years. The overwhelming majority (a combined figure of 73%) felt that LSPs were more interested in exploring initiatives which involve horizontal collaboration. There was very little difference between the responses of the logistics providers and their customers.

Question 3 asked a similar question but from the Shipper's perspective:

3. In your experience of logistics provision in the last few years do you feel shippers have shown more / less interest in exploring initiatives which involve horizontal collaboration in logistics provision?

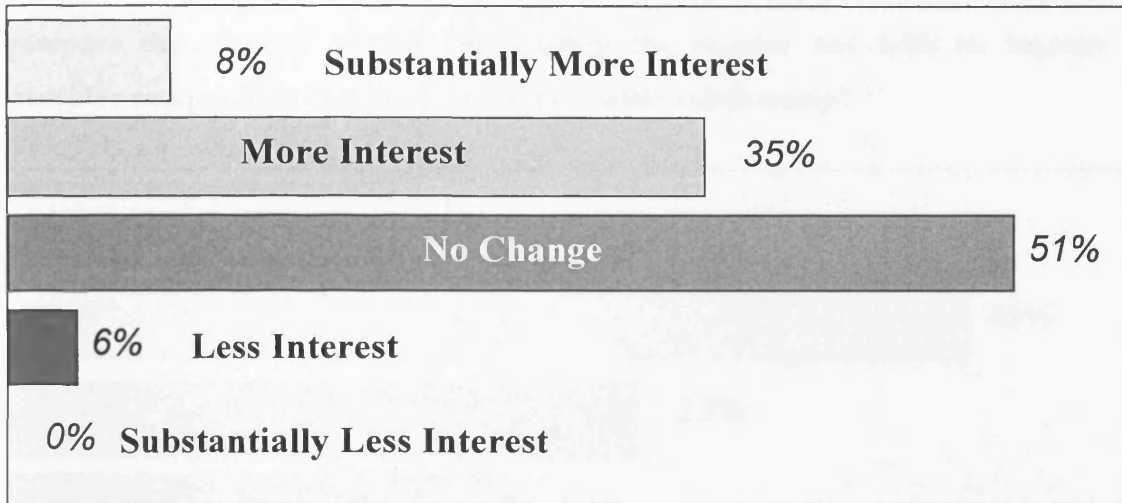


Figure 48: Shippers have shown more / less interest in exploring initiatives which involve horizontal collaboration in logistics provision

(Feedback from the Logistics Industry Members from the Audience at the 1st Morning Session of the Belfry Dissemination Conference – February 27th 2008)

The results here broadly concur with the findings to question 2 although the majority now has switched from “more interest” to “no change”, which indicates that the Shippers who are less involved in logistics practice are laggards in terms of understanding the implications of this change. This is also further endorsed by an analysis of the difference in responses from LSPs and customers of LSPs. Here there is a marked contrast with logistics providers recording that **74%** of Shippers have shown more (**63%**) or substantially more (**11%**) interest in exploring initiatives which involve horizontal collaboration in logistics provision; while customers of logistics responded much less positively with only **22%** saying that Shippers had shown more (**11%**) or substantially more (**11%**) interest in exploring initiatives which involve horizontal collaboration in logistics provision, and the vast majority (**78%**) responding that in their view there had been no change. This difference is very

revealing and again reinforces the view of the different perspectives of the LSP and the Shipper.

The fourth and final question asked was:

4. In your experience of logistics provision in the last few years how would you compare the strength of the relationship the shipper has with its logistics provider compared to the product buyer – seller relationship?

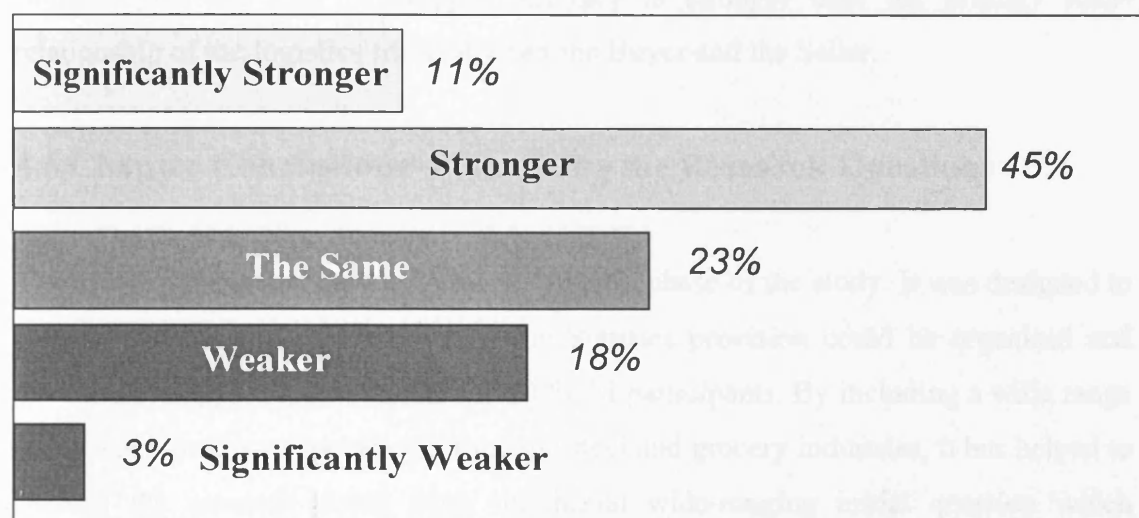


Figure 49: How would you compare the strength of the relationship the shipper has with its logistics provider compared to the product buyer – seller relationship?

(Feedback from the Logistics Industry Members from the Audience at the 1st Morning Session of the Belfry Dissemination Conference – February 27th 2008)

The final question probed into the interfaces across the two principal links in the Logistics Triad asking delegates to compare them in terms of strength of relationship from the Shipper's perspective. The Literature Review and the findings from the Exploratory study suggested that while no inter-relationship was easy to manage, the interface between the Shipper and the LSP was particularly problematical because their aims and ways of working were invariably radically different. However, the responses overall appeared to contradict this, suggesting that in fact the Shipper – LSP relationship was actually stronger in the view of **45%** of delegates and significantly stronger in the view of a further **11%**. Compared to this combined figure of **56%** only

a combined figure of **21%** felt they were either weaker (**18%**) or significantly weaker (**3%**) with **23%** being undecided.

When the responses were broken down to the level of the logistics providers and their customers it was found that broadly this view was shared by all groups.

This is a very interesting result. It does not mean that relations between LSPs and Shippers is necessarily strong but it does indicate that on balance in the view of this audience that the LSP – Shipper interface is stronger than the primary inter-relationship of the logistics triad between the Buyer and the Seller.

4.6 Chapter Conclusions – Finalising the Research Questions

This chapter presented the exploratory research phase of the study. It was designed to develop a better understanding how the logistics provision could be organised and managed to support mutual gains for all SCM participants. By including a wide range of evidence from two specific sectors, the steel and grocery industries, it has helped to channel the research down from the initial wide-ranging initial question which provided the broad initial focus of the research. The question was:

“What is the influence of modern Supply Chain Management thinking in the way outsourced logistics provision is conceived and practiced?”

In reflecting upon this it can be clear that SCM plays a different role and has a different level of influence on logistics depending on the sector. In comparing the steel and logistics sectors for example, the steel sector is still in its infancy in terms of supply chain sophistication and hence the values sought from logistics are more solely efficiency focussed. In the grocery sector the supply chain is more inter-dependent in characterisation and hence logistics providers play a more critical role in linking up entities with physical movement of product, with a wider set of values being prized. The quest for efficiency is still very evident but effectiveness in terms of reliability and reactivity are also important. SCM thinking is progressing and is supported by considerable developments in technology. There does appear to be a discernible trend

towards an acceleration of interest in the SCM agenda and as a consequence, logistics provision needs to be managed within and aligned with the contextual supply chain strategies. Having said this, the evidence from the conference interactive questionnaire suggested that there was still some way to go before this was a fully widespread phenomenon.

From this research a sharper focus on a core unit of analysis, the logistics triad, was arrived at. By combining the learning from the Literature Review and this Exploratory Chapter more focused research questions were concluded upon to be tackled in **Phase Two** and **Phase Three** of the study.

From the perspective of the Logistics Triad it is clear that it would appear to be a legitimate unit of analysis within whatever sector it is examined. However, there are clearly many questions which surround even its basic feasibility, let alone its applicability to all logistics and supply chain scenarios. The logistics triad is fundamentally about improving a horizontal process which cuts through more parochial functional or firm interests and thus like all SCM initiatives is challenging to introduce and see through to successful conclusions. It is also based on a number of inter-relationships. Each one can be problematic, but little research work has previously been recorded in improving all three dyadic links simultaneously across the triad or uniting the three entities behind single jointly accepted objectives over a sustained period.

This points to the need for a research study which looks into the logistics triad concept in some detail, taking into account many of the pertinent contingent issues and asking some basic questions, such as is it feasible at all and, if so, how can it be managed to realise the opportunities inherent within it? The research questions at the heart of this research study are therefore confirmed as follows:

△ **How suitable is the logistics triad as a unit of analysis in supporting the role of modern outsourced logistics within the setting and goals of supply chain management?**

△ **How should a logistics triad be managed so that the inherent opportunities are realised and the barriers overcome?**

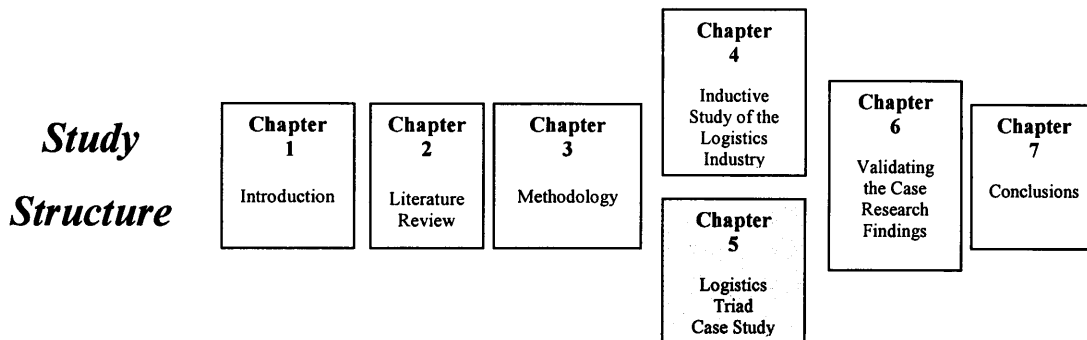
Chapter 5

THE LOGISTICS TRIAD – A LONGITUDINAL CASE STUDY

Chapter Aims

△ Showcase an in depth case study of a real three way logistics triad in the steel sector which comprises of an LSP, a Shipper and a Consignee over a longitudinal time frame

- Explain why the chosen triad was selected
- Present initial findings and progress made after
 - Nine Months and
 - Twenty Four Months



5.1 Introduction

The logistics triad is also a complex unit of analysis to study because it can be observed in various forms of governance and of scale and type of logistics provision. To clarify the stance taken in this research four assumptions are summarised below.

Assumption One: *The LSP is a third party rather than an in-house provider of logistics:*

In this study the focus is on outsourced logistics service provision, which, as has been noted, has grown in popularity especially over the last two decades. This trend has led to the rapid development of the contract logistics industry. Consequently, it will be assumed that the relationships with the LSP across the logistics triad are between

different firms. There are however clearly many other examples where either the Buyer or Seller of the goods retains an in-house logistics operation. A three way tripartite linkage would still exist but this time include two or more functions of the same firm.

Assumption Two: *The LSP is one firm:*

The study assumes that the logistics process is performed by one firm – a third party logistics provider. This invariably is the standard model for contract logistics where a single LSP wins a contract to provide logistics services for a client. However, as will be explored in the literature review, the contract logistics industry is maturing and new models have begun to emerge where logistics provision activities such as planning, controlling and/or operations are becoming fragmented and performed by more than one logistics firm. Alternatively, elements of logistics provision may be retained in house by the client, such as planning and/or controlling, while another element, for example the operations, is outsourced.

Assumption Three: *The Seller and Buyer of the products are separate firms:*

It is also assumed that the Buyer and Seller are different firms, although again there are examples where logistics service provision involves the physical transfer of product between Buyer and Seller functions of the same company. Whilst essentially beyond the scope of this research there are clearly parallels which can be applied where one or more of the relationships within the logistics triad are in-house.

Assumption Four: *The Seller of the product is responsible for organising outsourced logistics provision:*

It is generally presumed in the research that the Seller of the product is the entity which is responsible for organising outsourced logistics, often referred to in the literature as the “*Shipper*”. However, again, there are many examples where it is the customer of the goods which is the Shipper, organising logistics service provision. The application of the findings to the logistics triad where the Shipper is the product Buyer will be explored in Chapter Six. Beier (1989) in coining the term logistics triad, refers to the Shipper as the “*Consignor*” irrespective of whether they are the Buyer or the Seller of the goods. It therefore follows that the party Beier (1989) refers to as the

“Consignee”, the third party of the triad can either be the Seller or the Buyer of the goods depending on which party is the Consignor or Shipper.

Each of these assumptions is an important caveat to the study and will be reflected on in Chapter Six when the results of the research are assessed and the wider implications of the findings are explored.

“The idea behind supply chain management is to bring together parties beyond the boundary of the firm, in the case of logistics, the supplier, the customer and the third party providers to share the information required to make the channel more efficient and competitive”

(Ellram, 1991a)

As has been noted, much of the SCM and business relationship management literature focuses on the two-way or dyadic interactions between two parties in the supply chain. This can be between the Buyer and Seller of the tangible product, or if outsourced, the relationship between the Shipper (who can be either the Buyer or the Seller of the product) and the LSP (LaLonde and Cooper, 1989, Whipple et al, 1996, Bask, 2001).

Naturally however, the LSP interfaces with two parties in the supply chain, the Shipper and the Consignee, but in contrast this tripartite relationship although recognised as the *“logistics triad”* (Beier, 1989), has been largely under-researched.

This chapter focuses on this poorly researched area with the purpose of exploring the notion argued by Beier (1989), Ellram, (1991a), Gentry (1996) and Bask (2001) that, if the logistics activity is outsourced, the relationships the LSP has, with both the Shipper and also the third party in the triad, the Consignee, are important if the goals of integrated supply chains are to be more optimally realised.

The chapter is at the heart of the thesis and in summary presents an in depth case study of a real three way logistics triad in the steel sector which comprises of an LSP, a Shipper and a Consignee over a longitudinal time frame. In particular, the aim is to gain a deeper understanding of how improved information sharing and better alignment of performance measures between the three players of the logistics triad

may impact on their inter-relationships and overall supply chain performance. This is summarised in two research questions:

△ **How suitable is the logistics triad as a unit of analysis in supporting the role of modern outsourced logistics within the setting and goals of supply chain management?**

△ **How should a logistics triad be managed so that the inherent opportunities are realised and the barriers overcome?**

As has been discussed the logistics triad is made up of four relationships which are indicated in Figure 50 and are as follows:

:

- **Relationship 1:** The dyadic relationship between the provider of the goods (the Seller) and the customer of the goods (the Buyer)
- **Relationship 2:** The dyadic relationship between the Seller and the LSP
- **Relationship 3:** The dyadic relationship between the LSP and the Buyer
- **Relationship 4:** The tripartite relationship shared between all three parties in the triad

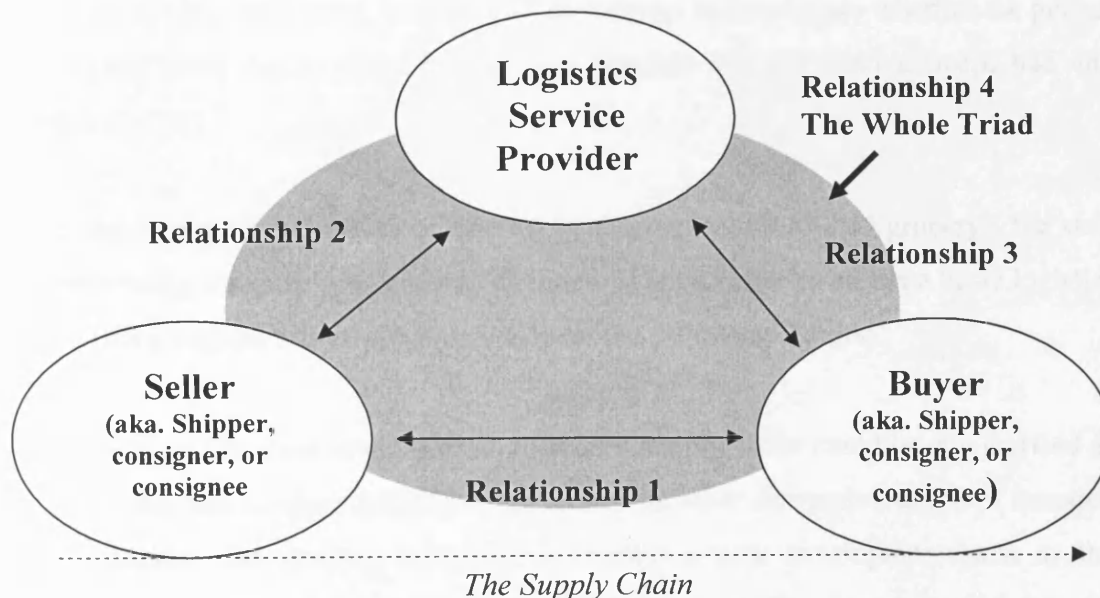


Figure 50: The Logistics Triad indicating the Four Relationships

As a consequence, the case study features four units of analysis, each focussing on a constituent relationship. However, it is the fourth relationship (the tripartite relationship between all three members) which is the principal concern of this study.

The complexity inherent in the logistics triad together with the paucity of previous empirical research on the subject led to the conclusion that a Case Study was the best research design which would allow an in depth study of the triad as a unit of analysis. It has been studied over a longitudinal basis for two years.

Before the findings are presented a few introductory points about this specific case study should be made, which have a bearing on how representative it is and other discussions concerning the validity and generalisability of the research.

5.1.1 Selection of the Logistics Triad Case Study

The selection of the specific logistics triad in the case study satisfied a number of requirements which have implications for the representativeness of the research. As discussed in this thesis, the logistics triad concept had been poorly studied since the name was first coined by Beier in 1989. In particular, few previous studies on the concept have had an empirical base. It was therefore felt that the case study should be based on a fairly traditional, basic logistics scenario to investigate whether the pursuit of aligned goals across three parties was feasible and the triad concept had any credence at all.

From the two main industries of interest (steel manufacturing and grocery), the steel manufacturing industry was selected as the most appropriate to assess a basic logistics triad. This selection was based principally on the following factors:

- The steel manufacturing sector's supply chain could be summarised as being less advanced in SCM terms than the other alternative sector of research interest, the grocery sector. This enables a new development such as the introduction of an aligned logistics triad to be assessed without the complication of having to account for the influence of other SCM initiatives

- Leading players in the steel manufacturing sector, such as the three companies selected for the case study, were keen to explore more integrated SCM concepts with an ambition to move towards more of a “supply chain orientation” (Mentzer et al, 2001). Involvement in such a trial therefore had the full support from senior managers and operators.
- Although, as been confirmed in the exploratory study presented in Chapter 4 the grocery sector is more integrated in the state of SCM practice, there is also more of a reluctance to include the LSP on an equal footing. Grocery supply chain movements such as ECR (Efficient Consumer Response) or the IGD (Institute of Grocery Distribution) focus on bringing primary supply chain partners together and do not include LSPs in their membership. Reference to this can be observed from the findings discussed in chapter 4.3.5.1 which reflected on the attitude of the product buyers and sellers towards the LSP in the grocery sector.

In selecting the specific logistics triad for the case study the most important aspects that were sought as desirable were:

- Good research access;
- Motivation of the three parties to pursue research to look at the collaboration which existed across the three entities;
- Full senior management support from all three parties.
- In keeping with this the fact that all three parties could be treated equally in research terms was also important. All planning and review meetings were open with no restricted access to any of the three parties.
- Relatively local proximity to the researcher’s base – being located in South Wales made it easier to maintain links over the duration of the longitudinal study

It also satisfied the criteria that the logistics triad was formed out of an existing logistics operation where, in keeping with most logistics triads, there had been no previous attempt to manage this logistics triad on a tripartite basis before including no forms of communicate/collaborate jointly across all three parties, or aligning of goals and measures.

Another important selection point was the fact that the LSP, for the most part, enjoyed an exclusive contract with the Shipper for the transport of steel products between the Shipper and the Buyer's sites (which is relatively normal in the steel sector). This was part of a wider contract they held for a number of the Seller's logistical operations. This made the launch and operation of the triad concept much easier than it would have been if there had been a multiple of LSPs. Communication was restricted to one LSP, who could own and take a pride in the whole logistics operation. This aspect also built from Gentry's (1996) finding that performance of the triad was best where the LSP had an exclusive contract. Clearly, one of the areas of future research which will be highlighted in the concluding chapter will be to investigate the feasibility of the logistics triad concept in more complex logistics structures.

The supply chain is in Wales in the UK. In this case study each of the principal entities involved – the Seller, the Buyer and the LSP are separate firms. The names of the companies involved have been withheld on confidentiality grounds. However, all are established players in their respective industries within the steel sector and each are constituent members of large multi-national enterprises.

There are implications in selecting this setting for the case study in terms of generalisability however. While the broad representativeness of the logistics provision model in the case study as being not too uncharacteristic of logistics provision in the steel sector was argued in Chapter 3.6.3.2.1 it should also be noted that by selecting the steel sector as the setting for the case study the capability to extend any findings to more advanced SCM settings is more limited. Care must be taken therefore in seeking to state any findings as applicable to logistics provision in other sectors, especially where a more advanced state of SCM is discernible.

5.2 Background to the Case Study

The logistics triad selected, is, as we have briefly discussed an established supply chain in the steel sector in Wales. Company A (the Seller and Shipper) manufactures among other products, steel coils from slabs (about 1.7 million tonnes annually from

this site). The coil specifications vary depending on the gauge, grade and thickness of steel. The market is highly competitive and dominated by price. To compete, the company's mission is to try and offer a differentiated product or service or both. They were therefore motivated to explore how improvements in the logistics triad could help with this aim.

This is interesting because it is in line with Whipple and Gentry's (2000) finding that "the delivery system has become a more integral part of the manufacturer's product offering – and as such logistics is increasingly viewed as a potential driver of differentiation".

The LSP (Company B) is one of the largest providers of logistics services to the steel sector in Europe. They had worked with Company A for some time on many contracts which had historically been contracted out and managed on a site by site basis. In the last few years, however, a regional strategy for logistics outsourcing had been developed by Company A. Company B was one of the leading logistics suppliers for Company A in Wales, as well as in a few other regions in the UK. Again they were highly motivated to encourage more, "joined up thinking" in logistics provision and exploring the notion of the LSP taking a more leading role in boosting logistics and overall supply chain performance. They were consequently also interested to participate in the logistics triad research work. On this particular contract road transport was used.

The Consignee, Company C, specialise in the manufacture of tubular steel products. The tubes division of the company in total has an annual capacity of 600,000 tonnes to a customer base which comprises both steel stockholders and end-users. This manufacturing unit is about 50 miles away from Company A's production site, a journey of around 1 ½ hours. Again, their market is highly dependent on price. They aim to be the lowest possible cost producer for the products, which have a wide range of uses in the construction, mining, automotive, agricultural, leisure and furniture industries. Increasingly however, they have also developed a reputation for a high standard of product quality and service. In terms of the research they had been suffering in recent months from a lot of uncertainty of supply and were keen to build in more predictability into their in-bound processes to support their business model.

Again they had a long-standing relationship with Company A, founded principally on commercial matters and forecasting issues. There was no discernable link with the LSP (Company B) and clearly no contractual link.

The objectives for each entity in the case study triad are summarised below and repeated on Figure 51:

Company A (The Seller) – To improve their delivery performance and explore how inventory could be reduced;

Company B (The LSP) – To encourage, “Joined up Thinking”;

Company C (The Buyer) – To improve reliability of deliveries

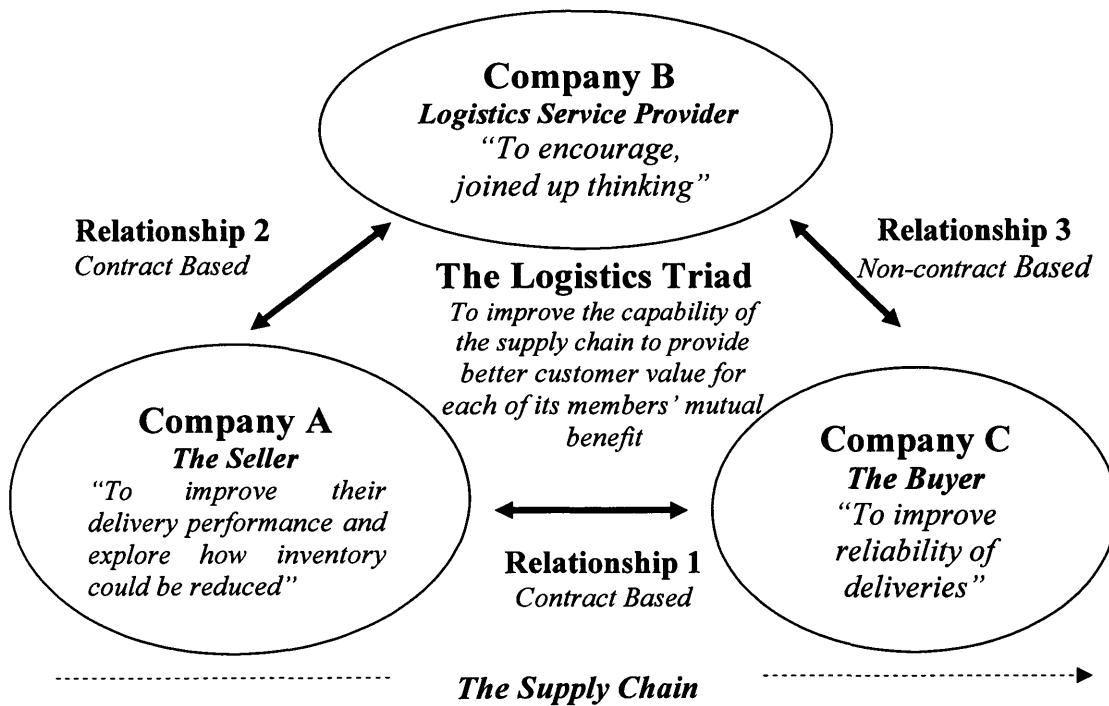


Figure 51: The Case Study Logistics Triad and each Constituent Member’s Stated Objectives for the Research Study

In addition the three parties agreed that their mutual overall goal was for:

“The Logistics Triad to be developed – to improve the capability of the supply chain to provide better customer value for each of its members’ mutual benefit”

One of the critical factors was the support of leaders from all the companies involved. The principal endorsers were: for Company A, a Senior Manager responsible for supply chain development; for Company B, their Managing Director and for Company C, also their Managing Director.

5.3 The Main Findings

5.3.1 Principal Supply Chain Activities

To present the findings, each of the four relationships of the logistics triad will be discussed, beginning with a description of the principal supply chain activities that occur across each of the dyadic interfaces

5.3.1.1 Relationship 1: The Buyer – Seller Interface

This “primary” interface of the logistics triad is the Buyer – Seller link where most of the core supply chain activities which are retained in-house within the respective concerns, occur. These include strategic long range planning, short term planning, forecasting, promotional activity, quality discussions, new specification development, ordering rules discussions, customer development and so on (interestingly, the joint management of logistics provision was not put forward by either the Buyer or the Seller).

The ordering process is the principal on-going activity on this primary interface and this is managed at two levels as follows.

Initially, a strategic long term production plan is developed by Company A. Although Company A is primarily focussed on competing on price, which is the dominant value metric in the steel production sector, it also needs to ensure that adequate volumes are attracted through its production sites. Sales teams feed in forecasts, after liaising with customers such as Customer C, details of promotional campaigns, expected sales growth, and details of priority markets and so on. This is combined with production

teams' inputs which include planned maintenance schedules and predicted rolling cycle frequencies. Finally, strategic planners assess predicted price fluctuations of steel which, as we noted earlier, can have a considerable effect on the size of the market at any one time. If the price is predicted to fall then buyers place restricted orders limiting requests to stocks which they urgently require, whereas if the price of steel is predicted to rise then buyers will be more likely to hedge their orders and become more over-optimistic about their requirements so that they are able to source more product at a lower price. The manager of Company C summarised the ordering process as follows:

“There is a lot of speculation in the steel market. Our ordering behaviour is very different if the price is predicted to fall compared to a predicted rise in the price. Sometimes we get to an unsustainable position where we are trying to buy steel to make tubes at a higher price than we can buy finished tubesit is important our suppliers place themselves in the market!”

Manager,
Steel Tubes Manufacturer, Company C

To determine prices all these long term production factors are taken into account and the quantity of feeder stocks and related sourcing decisions are determined. Costs are then drawn up by the finance department for the ensuing period. Once this foundation is completed the short term production plan is able to be acted upon as described below.

The order process and short term production plan are as follows: orders for steel coil are placed by Company C with Company A based on a six week forecast of requirements. This is driven by historical performance, current sales trends and stock levels and known customer orders. For most orders the product is supplied on a Make to Order basis, the lead time being on average six weeks. Company A specify rolling weeks and Company C agrees an order requirement against each cycle as long as it is within quotas agreed on the strategic long term plan.

However, for some popular specifications the order is placed against finished stocks already produced by Company A and stored by them. The supply chain picking and

delivery processes are then very similar. Clearly, this Make to Stock (MTS) product has a much shorter lead time (the time taken from placing an order to receiving the order) than the Make to Order (MTO) specifications.

Once the products are made ready for despatch they are packed (all steel coils undertake an 18-24 hour cooling period) before being sent by crane to a warehouse to await loading instructions.

All orders are made through e-Sure, an online order system.

One of the concerns that emerged centred on the unpredictability of demand from Company C to Company A. One of the issues in supply chains that was noted in the literature review and was also cited in the preliminary exploratory study in Chapter Four was that demand signals can be amplified through the bullwhip effect as orders are passed down through the chain. In this case this is exacerbated by a range of factors.

First, Company A is not the only supplier used by Company C for its raw materials supply, although Company A is the leading supplier given its close location. If the proportion of the order received by Company A varies, this will clearly have a distorting effect. Second, as the market is highly competitive Company C is very vulnerable to competition of cheaper imports especially from Turkey and southern Europe. This position fluctuates principally due to the demand position in Asia, notably China, in two key ways. Either growth pressures have the effect of sucking production eastwards, or on occasions bulk amounts of cheap exports from Asia are made available to steel producers, notably in Italy and Turkey for export through Europe. This again can have a significant dampening effect on demand levels experienced by companies such as Company C. Finally, amplification of demand is exacerbated in the steel sector by the presence of rolling cycles over a number of weeks. In this case Company C's rolling cycle is 5 weeks and Company A's is 6 weeks. This has the effect of distorting the smooth flow of orders over a 5 or 6 week cycle and also causes amplification as forecasting has to be made over an extended period. This is a significant difference compared to the operation in the grocery sector

where some products are capable of being produced once a day or at most every few days.

Therefore, a concern of Company A centred on any steps which could be taken to better stabilise the order pattern from Company C.

5.3.1.2 Relationship 2: The Seller – LSP Interface

Once production is confirmed with Company C, call offs are agreed and any required amendments made. A transport plan is then drawn up to maximise each load and the LSP, Company B, is notified of delivery details, usually on a day one for a day two delivery basis with a cut off of 2.00pm. Once accepted a loading instruction is automatically generated and this is placed into a schedule by the Company B's on site team.

Company B is made aware through the information link of the location and quantity of coils for loading. The steel coil is then loaded onto the trailer in time for the departure time. It is then picked up and moved by road to the Company C's site (about 50 miles away).

Once the lorry returns to Company A's site the time of delivery which was signed off at Company C is entered into a warehouse and transport management control system from which performance indicators can be produced.

The unpredictability of demand from Company C to Company A also has an impact on transport requirements which are again very uneven and unpredictable. So there was also interest from Company B's perspective on how amplification of demand from Company C to Company A could be better stabilised.

5.3.1.3 Relationship 3: The LSP - Buyer Interface

Usually, on arrival at Company C's site the trailer is parked close by and decoupled. An agreed time of delivery is notified. A shunter then completes the journey delivering the loaded trailers between 11.00am and 4.00pm the delivery window. The coil is then unloaded and is either stored in a small inventory warehouse waiting processing or processed straight away.

5.3.1.4 The Ordering and Production Process at Company C

Although in essence beyond the interfaces of the logistics triad, the goal of the supply chain is to provide value for the customer in this case Company C and therefore it is important to understand the ordering process which exists here with its customers. For Company C the ordering cycle is similar, although all orders are Make to Order (MTO) – no Make to Stock (MTS) production is carried out. All products supplied are made on a five week rolling programme, the length of each product cycle being determined by how much is ordered. Up to one week before the rolling cycle, customers can place orders for rolling which are honoured as long as raw materials are available. The production process involves slitting the steel coil into the right widths and lengths and then cold rolling into the required shape. The finished stock is then stored awaiting customers' call off.

5.3.1.5 Relationship 4: The Logistics Triad

It is clear from the discussion so far that very little supply chain planning, whether short term or long term, incorporates all three parties jointly across the logistics triad. There is evidence of a supply chain orientation between the Seller and the Buyer, but this centres on ordering and production issues such as price negotiations, product order specifications, forecasting requirements and so on – not logistics provision.

Transport planning is managed more on a reactive short term operating basis. Planning in terms of load specification is essentially managed by the Seller (Company A) while planning in terms of scheduling is managed by the LSP themselves. On the third interface, however, between the LSP and the Buyer, there is very little evidence of integrated activity at all. Yet there is scope for improvement, especially in enhancing the visibility of transport. The call off order from Company C to Company A takes 2 days to be processed by Company A before it is passed onto Company B. If this information could be passed to Company B sooner, greater planning time could lead to improvements in logistics capability for Company B. Also the largely separate interface between Company B and Company C is compounded by the manner of delivery which often entails just the dropping off of the trailer in a near by lay-by to Company C's site to be picked up by the on-site shunter when required. A more

interactive delivery method may help smooth out and improve communication between the two parties.

5.3.2 Principal Supply Chain Measures of Performance

Performance measures are important as they often drive behaviour and are a signal of the priorities that exist. At the outset of the study each entity suggested that improving the supply chain for the end customer and their mutual benefit was their goal, and this is in line with much of the literature discussed in Chapter Two. However, the measures of performance failed to match this aspiration.

5.3.2.1 Company A

The principal measure for Company A in terms of the logistics triad is ROTT – or Ready on Time Tonnes. This is calculated in the following manner. First, an aggregate total of the tonnage promised by week is calculated. Second, the actual tonnage made available for call off is calculated for each week. Finally, the two figures are compared and the resultant percentage is the Ready on Time Tonnes figure.

5.3.2.2 Company B

The principal measure for Company B is a DOT measure – Delivery on Time. This is calculated by taking the transport schedule and the times of confirmed delivery. A comparison of the two is taken and a percentage worked out. This is calculated by the warehouse management and transport planning system.

5.3.2.3 Company C

The principal measure for Company C was R&DOTT - Ready & Delivered on Time Tonnes. This is calculated in the following manner. First, an aggregate total of the tonnage promised by week is calculated. Second, the actual tonnes delivered on schedule of that order are taken. The percentage of the two gives the measure.

5.3.2.4 A Common Logistics Triad Measure?

Although the main goal for each company to support supply chain effectiveness is ostensibly delivery on time and in full, the performance measures that did exist are not aligned. Indeed, this absence of a shared measurement system exposed that there are

in fact a range of interpretations held across the logistics triad members of “what on time in full” actually means. Company A, the steel producer, measures whether the steel coil is manufactured and ready for delivery; Company C, the steel tubes manufacturer, assesses whether the steel coil ordered is delivered at their site on the date promised by Company A, while Company B, the LSP, measures whether the steel coil requested to be shipped is delivered to the transport plan. This confusion of goals and consequent misalignment in measures is summarised in Table 17.

	Predominantly Manufacturing Focused KPI	Predominantly Transport Focused KPI	KPI Measure
Company A Steel Producer	Yes	No	ROTT Ready on Time Tonnes
Company B Logistics Provider	No	Yes	DOTT Delivered on Time Tonnes
Company C Steel Customer	Yes	Yes	R & DOTT Ready & Delivered on Time Tonnes

Table 17: Conflicting Measures across the Logistics Triad

The different criteria for what constituted a delivery on time-in full led to a 20% divergence in recorded performance between Company B, the LSP and Company C over the sampled period. This created frustration and did not support the building of trusting inter-dependent relationships.

In addition to different measures, each party also developed its own measurement system. No sharing of measurement data occurs introducing the possibility of the same information being interpreted differently by separate parties.

In summary, the measurement system was misaligned, prone to mis-interpretation and failed to attribute accountability for distinct supply chain activities. This is emphasised by the Managing Director of Company C who stated;

“the research has highlighted that clarity of performance in terms of logistics provision is just not there... ..if a delivery fails to arrive, we are not always clear why this has not happened as planned”

Managing Director, Company C

5.3.3 The State of Relations across the Logistics Triad

The literature revealed that a wide spectrum of possible relationship types could exist in two-way or dyadic interface. Across the chosen logistics triad it was interesting to record the state of current relations. To achieve this, an extra research tool, a short questionnaire, was developed and deployed in conjunction with interviews conducted with key personnel for each of the three parties.

The following questions were asked of key personnel in each party. Two versions were provided so that responses could be gleaned of their views on both the other parties in the logistics triad. A Likert Scale was used to record a quantitative score to their response: 1 - low and 5 - high. Statistical means of the views obtained from the respondents across the triad (1 = low, 5 = high) were calculated and these were summarised as Low (below 2.0), Medium (2.1 – 3.0) or High (3.1 or above) summary ratings. The results are discussed below and are summarised in Table 18.

1. To what extent is the relationship with Company X adversarial (Low) or managed through partnering (High)?
2. To what extent does Company X have visibility of supply chain processes?
3. Is there a common alignment of supply chain performance measures between yourselves and Company X?
4. To what extent is there a cross-integration of expertise between yourselves and Company X?
5. To what extent does trust exist between yourselves and Company X?

In addition, questions were asked of each participant to support the assessment of how internally integrated they perceived their own company to be. Questions included:

1. Is there common alignment of supply chain performance measures within your Company X?
2. To what extent is there cross integration of expertise within your Company X?

The results are discussed below for each of the relationships in turn. Reciprocal views on partnering by one partner on the other were compared and found to be similar, increasing the validity of the findings.

5.3.3.1 Relationship 1: The Buyer – Seller Relationship

For each of the Relationships, the reciprocal views of the two parties of each other were captured and recorded confidentially so that no single person's scores could be attributed to them.

Interestingly, the internal level of partnering within companies was higher for all partners when compared to external relationships with the other partners. In this relationship the internal rating score of Company A was High, while Company C's score was also High.

In terms of the opinions across the triad in this primary interface, Company C's views on Company A stood at Medium, while Company A's view of Company C also stood at Medium.

Examples of concerns in this inter-relationship included:

- Company C not sharing forecasting information of customer demand with Company A;
- Customer complaints from Company C on quality not addressed by Company A;
- Company C not making effective use of information provided by Company A.

5.3.3.2 Relationship 2: The Seller – LSP Relationship

The two-way scores from participants on this relationship were as follows:

Company B’s views of the state of their relationship with Company A stood at Medium, while the reciprocal relationship was also Medium. Examples of concerns included:

- Δ Company A not communicating to Company B in real-time details of any technical problems (e.g. crane breakdown);
- Δ Company A gives Company B a delivery visibility of up to 24 hours. However, they actually receive a 72 hours visibility from Company C.

The internal relations within functions of Company B were scored at High.

5.3.3.3 Relationship 3: The LSP – Buyer Relationship

In contrast with all the other relations, the two-way scores on this third relationship between Company B, the LSP and Company C, the Buyer, were very different.

Key: Below 2.0 = Low, Between 2.1 & 3.0 = Medium, Above 3.0 = High		Subject of Opinion		
		Company A (The Seller)	Company B (The Logistics Service Provider)	Company C (The Buyer)
Source of Opinion	Company A (The Seller)	High	Medium (2)	Medium (1)
	Company B (The Logistics Service Provider)	Medium (2)	High	Low (3)
	Company C (The Buyer)	Medium (1)	Low (3)	High

Table 18: The Levels of Partnering between the Triad Members.
(The relationship number is highlighted in brackets)

Firstly, Company C’s score assessing the relationship they enjoyed with Company A was categorised as Low. This was, the worst score recorded for any of the interfaces and invites further analysis. The reciprocal relationship the other way was also categorised as Low although with a slightly higher mean score. This is the only dyadic relationship within the logistic triad where there is no underpinning contractual

arrangement. Given the notion that the supply chain is only as strong as the weakest link (Spekman et al, 1998), discussed in the Literature Review, this is a very interesting and insightful finding.

Figure 52 shows the same results this time on the logistics triad diagram.

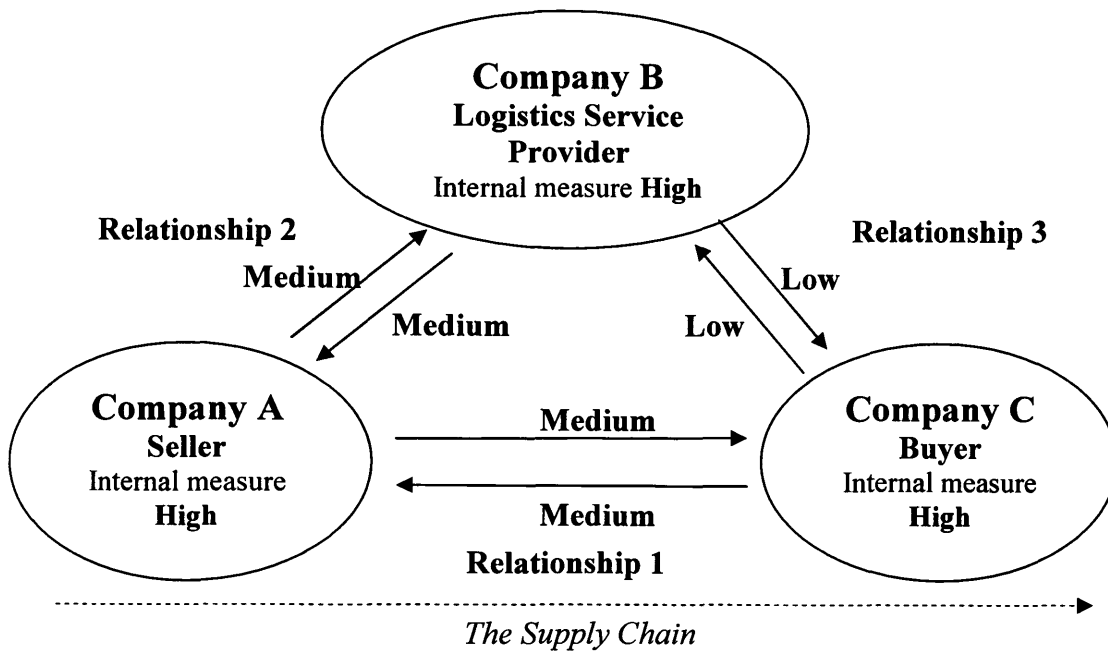


Figure 52: The Levels of Partnering between the Triad Members

In discussion, it was noted that the root of Company C's discontentment lay in the uncertainty of delivery performance, an area they had placed great emphasis on in their key objectives at the outset of the research.

Due to a range of factors the order to delivery performance was a major concern. Promised production schedules were not always maintained and this led to behaviour such as over-ordering and the build up of buffer stocks to protect in-bound supply, but at additional cost. For the most part Company C was also incapable of disaggregating the reasons for any recorded delivery failure between logistics or manufacturing causes. To them, an order which failed to arrive on schedule was considered as a delivery failure irrespective of whether in reality it was a logistics issue or not.

Company B was therefore invariably left with a number of issues to sort out irrespective of whether they had been the cause of them or not. This was exacerbated during times when price was due to increase and as a consequence demand levels were considerably greater than average. This frustrated both sides leading to a breakdown in relations and a breaking down of trust levels between the two entities.

5.4 Facilitating Improvements across the Logistics Triad

5.4.1 Better Integrating Logistics Provision into the Supply Chain Process

Overall, a strong message emerged from the initial study of the logistics triad. This was that logistics management was poorly integrated into the SCM processes which were managed between Company A and Company C.

Four principal thematic areas emerged to underpin this conclusion and formed the basis of an action plan for the three parties to take forward.

- 1. Improving communication of transport requirements from Company C to Company B via Company A;**
- 2. Dampening demand unpredictability from Company C to Company A – which also ultimately leads to fluctuating requirement for transport;**
- 3. Tackling the tripartite inter-relationship quality across the whole logistics triad;**
- 4. Improving inter-relationship quality on the poorest dyadic link between Company B and Company C**

It was also felt strongly that a new united performance measurement system should be developed to underpin this push towards a more cohesive and aligned logistics triad. So a fifth objective was added.

- 5. To align measurement of performance across the logistics triad**

5.4.2 Developing a New Aligned Measurement System for the Logistics Triad

As observed and discussed above, although performance measures existed they were not shared between the three parties in the logistics triad and despite purporting to measure the same thing – essentially delivery on time in full – were actually made up of different measuring systems and criteria held by each party.

A new co-owned measurement system was therefore developed. This focused solely on the distribution goal of delivering the call off order on time-in full and clearly attributed ownership to the correct party when a mis-delivery occurred through a system of failure codes. This dis-aggregation of the supply chain activities of production and logistics was an important step and gave clear responsibility to the respective roles of each of the parties involved, although Company A obviously was accountable for the entire process.

In developing the new measures Company B, the LSP, asked the Buyer, Company C, the supply chain customer of the logistics triad, “what were the main failure areas for failure to deliver on time-in full”? Seven failure codes were then identified, summarised in Table 19. The failure codes were a vital element as they helped to sort out the “blame culture” when things did go wrong.

The new measure was owned by all parties, endorsed by the senior managers involved, again from all three parties, and began soon after the research had finished. The logistics provider was responsible for compiling the KPI sheet but before the results were published each week all parties had a chance to challenge any attributed failure codes that they felt were unmerited. By uniting all three entities of the logistics triad together behind a common logistics goal it was hoped that the core logistics performance would improve and as a consequence improved relations would result especially on Relationship 3 between the logistics service provider and the buyer, the steel tubes manufacturer. A sample of the measure that was disseminated amongst the triad partners is shown in Appendix 6. An illustration of this can be shown more visually in Appendix 7. The key column is the “Performance to Original Plan” as this excludes unplanned emergency deliveries. However, the LSPs response and ability to accommodate these emergency deliveries, called “Screamers” is also important.

Delivery Failure Codes	Description
Disbanded	Loads planned by Company A, the steel producer, but not found by steel producer dispatch team or Company B, the logistics provider – so disbanded
Delivery Failure	Company B, the logistics provider failure to deliver by the time deadline
Traffic Delays, Breakdowns	Delivery failure outside logistics provider's control
Late Call Off	Delivery unable to take place due to late call off of order by Company C, the tube manufacturer
Late Planned	Delivery unable to take place due to late planning of transport by Company B, the logistics provider
Steel Producer Issue	Loading delay (includes too hot to load steel which can take 2-3 days to cool).
Steel Tubes Manufacturer Issue	Failure to receive a load – e.g. no one to empty at receiving bays

Table 19: Summary of Failure Codes Adopted in the Logistics Triad

One of the instrumental changes that had occurred during this process of establishing a new measure was the fact that the research had facilitated all parties to treat each other more as equals. If anything, the lead role had moved towards Company B, the LSP, who was now responsible for formulating the specifics of the measurement system with the support of the other two parties. This was a fundamental change to the way the parties had conceived of each other at the outset where the logistics service provider was considered more as a servant of the buyer, Company A, who appointed them and managed their contract and rarely had formal dealings with Company C at all.

5.5 Nine Months Review

A meeting was convened to follow up on the recommendations from the initial research after a time gap of around nine months. This was chaired by this researcher and included representation from each of the leaders of the logistics triad parties.

Each of the four headings developed in the Literature Review and explored in the preliminary study are used to frame this discussion, namely:

- **predictability,**
- **velocity,**
- **reliability and**
- **reactivity.**

Each is an important capability of integrated SCM. If improvements could be seen in any one or more of these capabilities then the improved operation of the triad would have resulted in an enhanced supply chain performance.

5.5.1 Predictability

Reducing uncertainty, in other words improving predictability of operational requirements is a fundamental goal of SCM. What had been achieved in improving the unpredictable demand signals from Company C?

As had been discussed in the initial study, most of the principal causes of this demand unpredictability were external factors, namely the use of other suppliers and the market conditions for raw materials and finished products. Due to the strength of these external factors beyond the control of the triad members, it had been very hard to provide a more stable and predictable order pattern. Demand had substantially increased during the intervening period but this was more due again to external factors which had driven increases in the price of steel.

“ Company C’s orders on Company A had increased during the intervening period since the initial research – but this should not be attributed to any changes in how the triad functions it is largely driven by price increases in steel in 2006 which have stimulated demand. Also as demand has been strong in other parts of the world – notably Turkey and China - competition in more local markets has been deflected away. Consequently it has been hard for Company C to generate more predictable demand on its suppliers.”

Managing Director,
Manufacturer Steel Tubes, Company C

One factor which had changed the predictability was the increase in the proportion of Company C’s orders that were supplied from stock rather than on a Make to Order basis. This had been achieved through Company A’s initiative to produce more Make to Stock specifications and also Company C’s willingness to modify some of its order requirements to these specifications. This in turn had affected on Company A’s measure ROTT (Ready on Time Tonnes), as the stock was already made and ready for call off.

“A large proportion of Company C’s supplies from Company A now come from stock however. ROTT has improved as stock is there to be allocated”.

Managing Director,
Manufacturer Steel Tubes, Company C

From the LSPs perspective the unpredictability of demand continued to be problematic.

“From an overall perspective the whole situation is very difficult. As product supply is erratic this exacerbates the amplification effect. When an order is first placed with Company A on time delivery performance should be tracked. If the due date does not materialise then all customers will order more just in case – the bullwhip effect – which spikes the load on transport.”

Managing Director,
Logistics Service Provider, Company B

There was general agreement that unpredictable, fluctuating demand for steel was a factor that the logistics triad would largely have to live with. At an overview level, the structure and systems used in forecasting, ordering, manufacturing and delivering material across the triad were found to be consistent with previous research findings in the steel industry (see - Potter et al, 2004), where demand was also quite erratic. This was due to a range of reasons, but notable contributory industry factors were the long lead time, the separation of initial order placement and call off and the temptation, especially when prices of steel were high for the supplier to over-fill the order book. This outcome was invariably exacerbated by the amplification effect which spiked the load on transport. It was felt that although desirable the triad members would be better placed to concentrate efforts on others issues which they could affect more profoundly, in particular the reliability of supply and deliveries and the ability to react to changing demands.

5.5.2 Velocity

In general there had been no real change in transport visibility. Lead time for transport planning was still 2.00pm Day 1 for delivery Day 2 (next day). In many ways the LSP were very accustomed to this kind of lead time and had not actively sought an extension. Indeed, they were used to working to even tighter lead times in other operations for the same client (2.00pm – 5.00pm orders for delivery the same night!). So on this triad the 2.00pm deadline for next day delivery was maintained. Although the research had identified that as call off in fact was 72 hours at times in front of the delivery, the appetite to provide the LSP with earlier notification was not there at this stage in terms of operating priorities from any of the three parties.

5.5.3 Reliability

A critical component of any logistics system is the capability to deliver on time in full. The literature review had suggested that this quality was becoming more critical in modern supply chain orientated businesses even to the extent where it was considered to be an order qualifier not an order winning capability. Clearly, however, in this steel supply chain, reliability of the supply chain process had been poor. Production was rarely carried out to plan (Ready on Time Tonnes figures were as low as 40% for part

of the periods surveyed in the initial study) and above this delivery on time performance had averaged only 75%.

The research study had attempted to dis-aggregate the production operation from the logistics focus and had emphasised that a clear goal was to improve the logistics element.

A renewed focus on the distribution operation had clearly emerged in the intervening period. This centred on the core role of getting the load to the site, delivering it and following everything through to ensure the distribution job was completed to a satisfactory level from all perspectives. This had had a dramatic impact resulting in a clear improvement in the actual and perceived performance of the distribution operation. Results for a typical six week delivery period showed that on time performance had improved substantially to 96% from a much lower figure earlier of around 75% at the time of the initial research nine months earlier.

This level of reliability had contributed to a substantial rebuilding of confidence and certainty into the whole logistics process. Moreover, when there were problems the clear attribution of blame had led to a substantial removal of frustration, back-biting and time-consuming problem solving that generally falls below the radar but are awkward issues to manage.

Interestingly however, from Company A's perspective, this marked improvement had not been detected. Their concentration was fully focused on their ROTT measure and although this had changed this had been for other factors as discussed above.

“From our commercial team's perspective – “not a lot has changed”. The ROTT (ready on time tonnes) figure has changed although for other reasons: Quarter 1 had been shocking (less than 50%) and Quarter 2 had seen an improvement (just over 80%). What tends to happen is that the ROTT figure goes in cycles depending on the backlog of production versus ordering rate. When the ordering rate is very high (e.g. when a price rise in steel is anticipated) the backlog gets bigger and the ROTT measure plummets.”

Supply Chain Development Manager, Steel Producer, Company A

Discussion centred upon the difference between a ROTT measure used by Company A and an OTIF (On Time in Full) measure used in the new system across the triad. From Company C's perspective if a delivery failed in the past it had invariably blamed transport when in reality it may have been a Company A's ROTT problem.

"From our perspective having these two performance measures separated has helped enormously in the case of an order failing to arrive to pinpoint where the problem lies".

Managing Director,
Manufacturer Steel Tubes, Company C

The newly introduced reporting process for the logistics operation led by the LSP was operating effectively.

"On a daily basis we produce a report which measures actual against planned delivery. This includes turn around time - reasons for failure and responsibility for problems.....the report is sent to all parties for checking and then linked into the on-going report of performance."

Managing Director,
Logistics Service Provider, Company B

Both the representative leaders from both Company B and C were delighted with the success that had resulted from this.

"From our perspective it is important to put on formal record that following the initial research and through the implementation and follow up of the recommendations logistics supplier performance has improved considerably. This has resulted in the removal of a lot of frustration, back-biting and time-consuming issues that generally fall below the radar but are awkward to deal with. May I say thank you formally to the logistics suppliers and give credit where it was due."

Managing Director,
Manufacturer Steel Tubes, Company C

“it is important to recognise what can be achieved if the 3rd party provider is treated seriously. Win-win benefits can be achieved delivering better value for all parties.

*This principle needed to under-pin any roll out of this exercise
the keys to its success are its transparency, its simplicity, the fact that it is easy to produce and that it is owned by the logistics service providermore information is produced than parties have ever had before”*

Managing Director,
Logistics Service Provider, Company B

Company A’s representative was also very encouraged by the improvements, and added:

“it is important now to ensure that the lessons learnt from this exercise are understood and to ensure progress made was sustainable.”

Supply Chain Development Manager,
Steel Producer, Company A

Following the introduction of this new measurement system there had been a step change in the dialogue between Company B and Company C. Trends were easier to spot and any drop off in performance was being picked up and acted upon more quickly. The new KPI system had produced new confidence in each other’s ability. This had also fed into their respective reactivity capability.

“It has led to a substantial improvement in performance and acted as a catalyst for further collaborative improvements.”

Managing Director,
Manufacturer Steel Tubes, Company C

5.5.4 Reactivity

The improved delivery performance and confidence in each others roles also resulted in softer improvements. These included capabilities such as a more flexible, trusting and accommodating approach between Company B and Company C. At the time of the review this was producing a solid foundation for potential new strategic

investments to be put in place to ensure continued performance improvement for all parties. Highlighted below are some examples of this new capability to be reactive and flexible in both the short and long term.

- Δ On peak days there had been dialogue between the two parties to open the gates for deliveries earlier (before 9.00am) so that the daily window for delivery times could be extended;
- Δ On certain days a “screamer” is requested. This is an order (by 2.00pm) for delivery on the same day on urgently needed products. This is clearly above the original transport plan and could cause problems but was built into the new KPI system as a separate column and had been well supported by the logistics service provider;
- Δ Company C had focussed on improving vehicle turn around times to the benefit of Company B and themselves – more runs could be completed during any one day with the same vehicle;
- Δ Joint investment plans in more structural long term projects for greater transport efficiency, were being discussed including:
 - the purchase of a new crane at the manufacturing plant (currently the largest crane’s weight limit is 19.6 tonnes). This would mean increasing the capacity of transport to carry fuller loads as the crane would be able to handle up to 25 tonne coils providing benefits for all three parties on the logistics triad as well as external benefits in terms of emissions reduction from transport, and
 - the possibility of weighing in of vehicles to be re-considered. This could mean either the re-location of the weigh-bridge for in-bound freight which would speed up the vehicle turn around or the possible stopping of weighing (a major step as there had been occasions where the weight was incorrect). Both these measures would provide real benefit to the haulier in improved turn around time.

5.5.5 Relational Impact

At nine months the profound improvement in the weakest link of the logistics triad between Company B, the LSP and Company C, the Buyer was quite discernable and supported by the comments of the senior managers involved in the initiative.

“One of the principal benefits of the research on the logistics triad was to highlight the weak link between the buyer and the logistics service provider. This has now been strengthened by “dropping the guard” between the two entities.”

Managing Director,
Logistics Service Provider, Company B

With the basis of improved delivery performance and more transparent and aligned measuring system confidence continued to grow between Company B and Company C, which had the effect of strengthening the logistics triad as a whole. In turn a trusting relationship between the two parties began to emerge. The weak link on the triad and in the supply chain had begun to be shored up.

It was felt by the group that the new KPI method had worked because it was owned by the operational teams connected to the order and delivery process and not imposed from directors away from the site. It works as Company B, the logistics service provider, collect the data and measure the right thing.

“Its strength is its local focus –the team own the measure - it would be wrong if this was backed into a centralised system of Company A”

Managing Director,
Logistics Service Provider, Company B

Essentially it was very simple – allowing service to be ramped up by the delivery agent. A simple cause analysis had been completed, a clear system of failure allocation had been devised and an honest and transparent method for compiling the data had been developed. The results were clearly visible to all parties and it was supporting a more trusting partnership which was demonstrably developing between Company C and Company B.

However, perhaps surprisingly, Company A were largely oblivious of any changes although it was the quality of service of their contracted shipper carrying their product on their order which had improved. The reasons for Company A’s position on this were explored.

Firstly, Company A's director for manufacturing was not responsible for logistics. Consequently, his key service measure was ROTT – Ready on Time Tonnes – not DOT (Delivery on Time) or OTIF (On Time in Full). Therefore the hierarchy of measures from sites to the functional head do not provide incentives for delivery on time in full in the way the logistics performance measure achieves.

The obvious question was then posed – “if Company A does not measure OTIF or an equivalent measure how do they know how well the logistics provider is performing?”

The Senior Manager from Company A replied stating,

“We measure companies like Company B with great difficulty – there is a SCIR (Service Contractor Improvement Requests) system which measures the rate at which providers follow through on improvement requests but there is not really a measure of delivery failure or success rate. – we rely on non-conformance issues being raised by customers – if the provider is reported too many times then this is our measure.”

Supply Chain Development Manager,
Steel Producer, Company A

This was a powerful and interesting insight and struck at the heart of many of the issues that the research had been keen to address. This issue will be picked up and developed later in the analysis chapter.

5.5.6 The Role of the LSP in the Logistics Triad

One of the major successes had been to influence the changed perception over the role of the logistics service provider, which was beginning to be recognised as more of an equal partner much to the delight of the Managing Director of Company B

“haulage should be considered to be more than just a flexible friend..... the haulier should be brought in as an equal partner into strategic discussions about operations and help to drive better “Joined Up Thinking”when there is a quarterly or half yearly review the haulier should be there rather than being told about the outcomes

afterwards - the do as your told culture should change to a more thoughtful relationship base”

Managing Director,
Logistics Service Provider, Company B

5.5.7 Conclusions

The dis-aggregation of roles, a clear focus from all parties on logistics matters and the support of a simple yet effective, revised and shared performance measurement system had substantially altered the results achieved, in terms of logistics provision and logistics role in supporting enhanced supply chain performance. In addition, relations had been improved especially in Relationship 3, the weakest link at the time of the initial study between Company B, the logistics service provider and Company C, the buyer. There had been no tangible structural change to the operation – the operation remained unaltered. But there had been an intangible structural change and this renewed focus on the operation which had emerged centred on getting the load to the site, delivering it and following everything through to ensure the job was done to a satisfactory level.

5.6 24 Months Review

After two years (15 months after the first review), the logistics triad was revisited again to establish whether improvements noted at the time of the first review had been sustained or not. To ascertain this, interviews were set up with each of the key personnel involved from the respective organisations. In addition, the questionnaire, which had been used to gauge the level of relationships across the triad at the initial review, was reused and new updated scores calculated. The discussion is presented from each of the interviewees perspectives. Before this a brief summary of the principal results obtained from the review is presented.

5.6.1 Delivery Performance

A snap shot of the delivery performance for the annual year up to that point (42 weeks) was taken at the two year (24 months) review meetings. The results indicate that the improvements noted in delivery performance after nine months had continued

to be achieved by Company B, the LSP. At the time of the initial research two years earlier delivery on time success rate was recorded at 75%. After nine months it had improved to 96% and at this latest measure this result was maintained at 97%. This is summarised in Table 20.

Weeks	Deliveries between Company A & Company C by Company B		Percentage Success Rate
	Planned	Actual	
Weeks 1 – 42 (2007)	1365	1318	97%
N.B. Data was missing in weeks 31-35			

Table 20: Delivery on Time Percentage to Company C – progressive 42 week performance 2007

The performance in recent weeks has been even better at 99% for the preceding 20 weeks.

One important feature of the new measuring system was the clear attribution of a fault code for each delivery failure. In the past Company B were blamed rightly or wrongly for all mis-deliveries. Under the new measurement system clear attribution of blame was specified. The breakdown of the reasons for the 47 recorded delivery failures was as follows:

- Δ Disbanded – 27
- Δ Delivery Failure – Company B – 10
- Δ Traffic / Vehicle Breakdown – 4
- Δ Company A Issue (e.g. too hot for loading) – 3
- Δ Others incl. - Late call off, late planned, or Customer C issue – 0
- Δ Not Known - 3

On assessing this breakdown it indicates that for the deliveries in 2007 up to the review point the LSP, Company B, had only been at fault for a mis-delivery for 10 deliveries out of a total of 1365 planned trips (a success rate of 99.2%).

The biggest cause of problems was in fact disbanding. This was defined as: “loads planned by Company A but not found by Company B – so disbanded. For Company C this was clearly a frustration as the delivery did not materialise even though according to Company A this problem did not negatively impact on its ROTT measure. 27 mis-deliveries were due to disbanding out of a possible 1365 is equivalent to a **2.0%** error rate.

On further analysis 10 of the 27 mis-deliveries due to disbanding occurred on the same week – w.e.31/03/07 and 5 actually occurred on the same day – the Friday. The distribution of the rest of the mis-deliveries was evenly spaced across the weeks in the first half of the year – interestingly however, there were no problems of this nature reported from the middle of the year to the end of the sample period.

Towards the end of this measuring period however, a significant change in the way in which logistics provision was structured and managed in Company A had taken place. Rather than regions within divisions being responsible for the contracting out of logistics, a national, centrally controlled structure had been adopted. A new lead logistics provider or 4PL had been appointed to manage and control logistics provision in terms of road transport between sites across the whole of the UK. The change was rolled out gradually but meant that from mid-summer in 2007 the LSP, rather than being contracted by Company A, was now sub-contracted by the lead logistics company. This also meant that Company B was no longer the exclusive operator on this route.

There are many issues to consider in this change which is proposed as an area of follow up study in the final chapter. Nevertheless, it is an important issue to raise at this juncture as it clearly has an implication in how the logistics triad operates. During this period however, the new measurement system was maintained by Company B, but interestingly only for deliveries they were responsible for!

This raises some interesting questions around the ownership of the measure. One of the successes of the logistics triad had been the local ownership of the measure by the LSP, Company B. However, this was now an impractical solution in the new structure.

Alternatives for ownership of the measurement system which may be considered on future research were:

- Δ The lead logistics provider or 4PL;
- Δ The actual hauliers (LSPs);
- Δ Company A's transport management personnel

The introduction of the new lead logistics provider also posed issues surrounding the management of relationships across the old logistics triad, which was now much more complex than it had previously been. Again these issues are explored in the next Chapter.

5.6.2 Interview Feedback

During each of these final interviews with key personnel from the triad the same set of questions were asked:

1. How has the new measurement system impacted upon performance?

All parties considered that the measure which came in during spring 2006 had supported a significantly improved performance. The Managing Director of Company B, for example, noted that "it had helped to align everyone's job at his company". The figures highlighted in Table 22 help to triangulate this response and provided extra validation for this.

However, Company A still saw that ROTT (Read on Time Tonnes) was their principal supply chain measure and had not incorporated a delivery success measure into their suite of supply chain measures up to the point of the appointment of the new lead logistics structure.

"The key measure used at Company A is still ROTT – Ready on Time Tonnes – we calculate this on a weekly basis by looking at the CSDP (the Customer Service Delivery Promise) for a certain week and then looking at actual ROTT against this promise... there is no specific delivery on time measure which is conducted for Company C by us..... logistics issues such as delivery are considered as only one

supply chain issue which our Customer Service Representative covers when he meets with Customer C to discuss any occurring issues every few weeks”.

Account Manager (for Logistics Triad Customer C)

Steel Producer, Company A

2. What does the ROTT data show – in terms of performance?

To glean a picture of the performance of the ROTT measure over the lifespan of the new logistics triad, an analysis of the data was made. The ROTT figures were taken from the beginning of 2006 until October 2007. A code was given to each week:

- **G** – 90% +
- **A** – 60% to 90%
- **R** – less than 60%

During that period (83 weeks) the ROTT performance can be summarised as follows (Table 21):

Category of Performance	Occurrences in weeks Jan 2006 – Oct 2007	Percentage
G	11	13%
A	63	76%
R	9	11%
Total	83	100%

Table 21: The ROTT performance for Company A for Company C orders in 2006/07 (In the seven quarters measured ROTT was characterised by uncertainty for the customer. In 87% of weeks ROTT was below 90%).

The picture is potentially worse than this in that the measure is just aggregated across all the products promised. Therefore if a promised delivery occurs a week late, this could have the effect of indicating a good week on the figures for the subsequent week even though the actual promise was broken. This explains why some weeks had a performance of over 100% - weeks 18, 19 and 45 in 2006 and weeks 5 and 20 in 2007.

3. Would it be possible to extend the logistics triad measure?

One area that was interesting to reflect on was the potential for extending the idea of setting up shared and aligned measures across other logistics triads. At the nine month review meeting the Supply Chain Development Manager at Company A had suggested feeding the results through to the Commercial Director to commence a wider trial but this plan had been muted by the decision to move to a new lead logistics structure. Feedback to this question included....

“A lot depends on who owns it. Ideally it should be owned by the lead logistics provider or the shipper. This is not currently the case.....”

Currently we complete it and pass it to Company C and to Company A. But when another logistics service provider does the logistics work (which they have occasionally done over the last few weeks) a similar document is not produced at all.....”

The new lead logistics providers systems are currently not set up to record measures such as these.”

Managing Director,
Logistics Service Provider, Company B

4. How have relations changed since the introduction of the KPI system?

It should be noted here that unsurprisingly over a two year time span that there had been a number of personnel changes in all three companies, although there was also some continuity as many personnel had remained connected to the operation (all be it in new positions). In Company A the Supply Chain Development Manager was still in position, although some of the operating personnel had changed. In Company B, the Managing Director had retired, but had been replaced by a former Senior Manager who had previously been responsible for the logistics triad operations among other roles and therefore had been fully involved in each stage of the research. Similarly, the Managing Director of Company C had been promoted, but had been replaced by a Senior Manager who had again participated at each stage of the research study. So while there had been some changes in personnel and job titles, there was a reasonable level of continuity throughout the two year study.

In terms of inter-relationships between the entities of the logistics triad, exactly the same questions were asked of key personnel in each party as at the outset of the study. Again a Likert Scale was used to record a quantitative score to their response with 1 as the lowest and 5 the highest rating. The results are discussed below and are summarised in Table 22. These are the statistical means of the views obtained from the respondents across the triad converted into broad categorisations of Low (below 2.0), Medium (2.1 and 3.0) or High (3.1 and above).

The questions posed are detailed in the Methodology Chapter and repeated in section 5.3.3 of this chapter. The results of the questionnaire in terms of quality of inter-relationships were as follows:

5.6.3 Relationship 1: The Buyer – Seller Relationship

This relationship has continued to contain many types of integration both at formal and informal levels. Company A reports that in their view the relationship is, “a very close, mutual relationship” and this is reflected in the scoring which now is High from Medium previously. In recent weeks they cite that, “new products have been developed with them” and there is, “a strong focus on prices and grading improvements”.

The reasons for this improvement became clear in the interviews. Interestingly, it reinforces a point made in the Literature Review that in the Buyer - Seller relationship logistics is only one of a number of supply chain related issues and processes that attract the attention of personnel across this interface. Indeed, if logistics operations are working smoothly, which in this case was occurring at this stage, they do not become a priority issue to be discussed at all at times. In many ways this is further endorsed by the changes in logistics structuring to a 4PL lead logistics business model which leads to less direct interfacing between Company B and Company A.

The picture on Relationship 1 is slightly different when seen from the other perspective. Here the score has been maintained as Medium, although the mean score is slightly lower. This can be partly attributed to the supply chain matters such as prices and grading which have been recently discussed. From discussion with

Company C personnel this poorer rating is not connected to the logistics performance which continues to be very satisfactory in their view.

5.6.4 Relationship 2: The Seller – LSP Relationship

The two-way scores from participants on this relationship were as follows. Originally, Company's Bs views of the state of their relationship with Company A stood at Medium, while the reciprocal relationship was also Medium. After 24 months an improvement had been recorded in the Shippers view of the LSP to High, while the LSPs view of the Shipper had remained the same at Medium.

Since the introduction of the lead logistics provider there had been a change in the amount of interaction between the two companies. This is perhaps not surprising in that Company B's contract and instructions no longer come directly from Company A. However, it is perhaps a concern which should be revisited after a period.

The contact directly with Company B is much less than it used to be because of the role of the 4PL”

Account Manager (for Logistics Triad Customer C)
Steel Producer, Company A

5.6.5 Relationship 3: The LSP – Buyer Relationship

This relationship had been the weakest link across the logistics triad at the outset of the research study. The scores after two years bore testament to the anecdotal comments that had been gathered that relations across this interface had improved considerably. Firstly, Company C's score assessing the relationship they enjoyed with Company B came to a High categorisation. This compared to the categorising ranking of Low that had been initially recorded which represented a considerable turn around.

“The project has brought about significant improvements in delivery performance and reductions in the associated management time and hassle associated with missed deliveries”

Managing Director,
Steel Tubes Manufacturer, Company C

Company B's score assessing their relationship with Company C was Medium. Again this was a considerable improvement on the initial measure which was Low.

“Interaction has evolved from senior level to now a more operational level. It has resulted in better working relations between Company B and Company C – there is more confidence and trust under-pinning the relationship and has resulted in a reduction of management and operators time in having to deal with niggling issues – As a result savings have been generated although it is hard to quantify them”

Managing Director,
Logistics Service Provider, Company B

This is the only dyadic relationship within the logistic triad where there was no underpinning contractual arrangement. However, this still had not prevented an enhanced relationship being developed. These findings are very interesting and will be analysed in relation to theory in the next Chapter.

Key: Below 2.0 = Low, Between 2.1 & 3.0 = Medium, Above 3.0 = High		Subject of Opinion		
		Company A (The Seller)	Company B (The Logistics Service Provider)	Company C (The Buyer)
Source of Opinion	Company A (The Seller)	Medium (High)	High (Medium)	High (Medium)
	Company B (The Logistics Service Provider)	Medium (Medium)	High (High)	Medium (Low)
	Company C (The Buyer)	Medium (Medium)	High (Low)	Medium (High)

Table 22: The Levels of Partnering between the Triad Members, after 24 months.
(The score at the outset of the research is indicated in brackets)

A summary of the results are provided in Table 22 with the initial scores shown in brackets. Figure 53 shows the same results on the logistics triad diagram and is

presented with the scores given classifications based on < 2 = low, 2.1 - 3 = medium and > 3 = high.

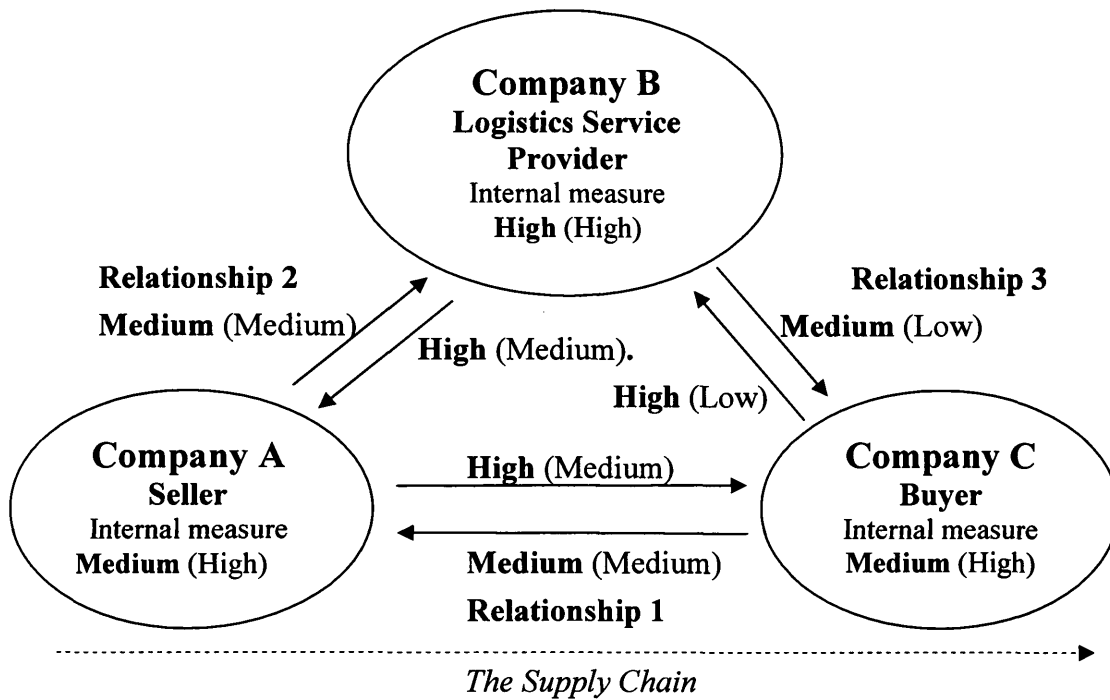


Figure 53: The Levels of Partnering (rating High, Medium or Low in bold) between the Triad Members, after 24 months.

(The rating at the outset of the research is indicated in brackets)

5.6.6 24 Months Conclusions

In conclusion to the interview with Company C, the following points were made by the Managing Director on behalf of their operation which summed up what had been achieved.

1. Prior to the project there was a lack of aligned vision between the three parties
 - a. There were a number of complaints which surrounded the delivery operation;
 - b. There was a lack of understanding of Company B's (the logistic service provider's) role;

- c. There was a low comprehension of how the logistics service provider fitted with the other parties in the triad – especially Company C - to fulfil the objectives of the other parties;
 - d. There was a lack of visibility of logistics service provider's performance on their core purpose – delivering on time in full
2. The new focus importantly had senior management attention and addressed the key issues detailed above.
 3. The project has brought about significant improvements in delivery performance and reductions in the associated management time and hassle associated with missed deliveries.
 4. The new measurement system has remained robust throughout the two years since implementation despite volumes oscillating during this period.
 5. There is a risk that with the fragmentation of logistics supply, logistics performance could slip back to where it was originally. However, there is no indication of this occurring at present.

5.7 Conclusions

The logistics triad is a multi-dimensional organism which is more complex to assess and research than a conventional dyadic relationship which has been conventional in supply chain research. However, as supply chain activities such as logistics are more frequently outsourced it is potentially an important unit of analysis when researching modern supply chains. This research study has found through a longitudinal case study that a weak link in the chain can emerge if a logistics triad is not managed appropriately. This can manifest itself especially between the LSP and the consignee where there is no foundation of a contractual base.

By bringing all three parties in a logistics triad together to identify strengths and weaknesses in business relations on a tripartite basis, and then pursuing a collectively

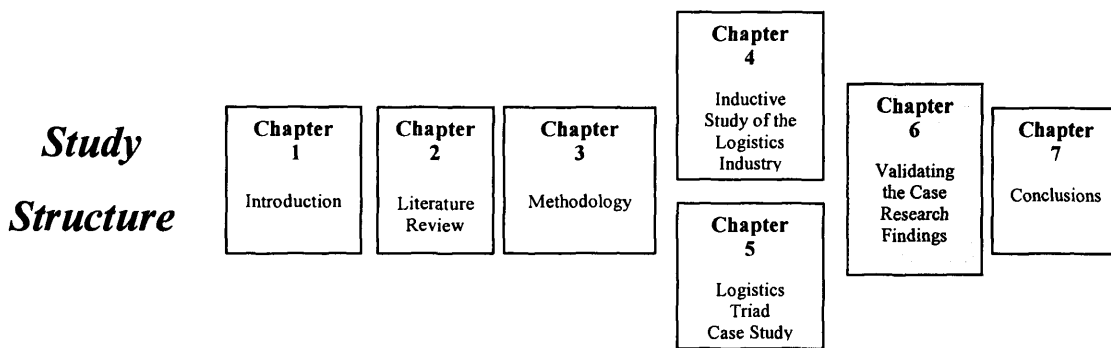
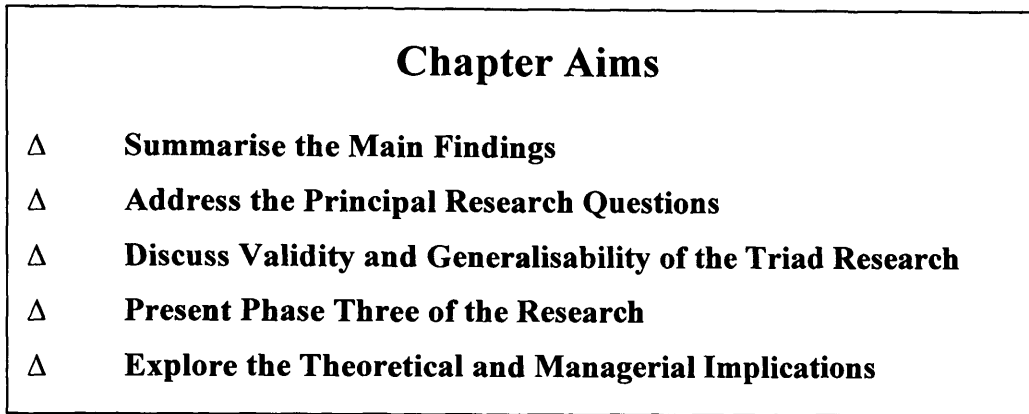
owned improvement programme, performance and relations can be developed which can provide sustainable benefits to all three parties and the supply chain as a whole. This conclusion underlines the potential importance of the LSP in developing their role as supply chain leaders linking buyers and sellers together more effectively.

“Since we have been put in charge of the compilation and monitoring of the KPIs with the buyer there have been no issues”. –

Senior Manager of Logistics Operations (Responsible for this account)
Logistics Service Provider, Company B

Chapter 6

VALIDATING THE CASE RESEARCH FINDINGS



6.1 Introduction

Third party logistics providers, as their name suggests, have an inherent relationship with not one but two other connected parties; one they are contracted to, the Consigner, and the other they work with, the Consignee. This research study has attempted to develop a fuller understanding of the concept of the logistics triad, as this three-way link has been coined, and the relevant issues which surround it. This has been achieved through an extensive literature review, an exploratory inductive piece of research and a longitudinal in depth case study which followed the impact of a newly collaborating logistics triad from its set up for the ensuing two years.

The theory presented suggested that the adoption of an aligned logistics triad across all three constituent members could lead to an improvement in performance and therefore potentially could form the basis of, or contribute towards, a sustainable

competitive advantage for participating members. On the other hand it has also been noted that successful management of inter-business relationships can be very challenging merely at a dyadic level, let alone trying to manage inter-relationships between three parties in a logistics triad, and that achieving successful tripartite relations over the medium to long term could be too problematic. These difficulties could also be compounded by the frictions that can often be present in Shipper/LSP relations, which can invariably be characterised as a master and servant type of interaction and the fact that little effort has been recorded as occurring in strengthening the third relationship in many logistics triads between the LSP and the Consignee. This would support the alternative argument that pursuing an agenda that concentrates on alternative strategies to supply chain structure other than the pursuit of a more aligned logistics triad may well be a more beneficial way forward.

To help focus this research, two principal questions were drawn up from the Literature Review presented largely in Chapter Two and the exploratory inductive study presented in Chapter Four. They were as follows:

Δ How suitable is the logistics triad as a unit of analysis in supporting the role of modern outsourced logistics within the setting and goals of supply chain management?

Δ How should a logistics triad be managed so that the inherent opportunities are realised and the barriers overcome?

This chapter provides an assessment and an analysis of the results and findings stemming from the research. Both questions were “how” questions which pointed to a case study methodology being the most appropriate research methodological approach. The method provides a rich level of detail from which each question can be answered with the surrounding contextual issues being more fully recognised.

The chapter is set out as follows. First, the main assessment of the findings is presented, including an appraisal of the validity of the research and its potential generalisability. This section is supported by Phase Three of the research, a presentation of results from a survey of logistics professionals who were asked to

comment on the findings and feedback on the relevance of the research to their own situation. Next, the implications of the study results are explored, looking at what the research means in theory and in practice. In particular the strategic significance of the findings is debated, reflecting on whether the development of a logistics triad may contribute to theories which support the generation of a sustainable competitive advantage. Finally, chapter conclusions are reached.

6.2 Assessment of the Validity of the Case Study Findings

This section assesses the validity of the findings and results from the case study of the logistics triad presented in Chapter Five. The subject of validity in research was introduced and reflected on in the Methodology Chapter (Three). Here two aspects of validity will be assessed – internal and external validity. In terms of internal validity the confidence that can be concluded upon in terms of the relationship between variables will be discussed. This is followed by a substantial analysis of external validity – also known as generalisation. The difficulties of generalising from case studies are again discussed. To partially compensate for this weakness the results from Phase Three of the research are presented. This comprises of a survey of logistics professionals taken at a recent conference where the feedback to a series of questions relating to the research was obtained. It provides some indication of the applicability of the triad study to other settings. To introduce the section, a summary statement on the main findings is presented.

6.2.1 Introduction – Statement of Improved Performance of the Triad

In the case study it was demonstrated that a step change and sustained improvement in the logistics performance of the triad had been generated over two years. This was principally in the form of delivery on time and in full which rose from around 75% to be consistently around 96% over the ensuing 24 month period. An inventory stockholding warehouse managed by the Shipper at the Consignee's plant for in-bound supplies of product from Company A was also removed.

More intangible, softer changes were recorded, noticeably the improved culture of trust, openness and dialogue across the triad members. This was particularly discernible between the Consignee and the LSP which had been the weakest, most distrusting of the inter-relationships in the logistics triad at the outset of the research.

Finally, new potential areas of joint investment were being considered together by the three parties.

These results demonstrate that important steps in improving the capability of the logistics operation across the triad were achieved during the case study period to support SCM strategies, which depends upon efficient and effective logistics operations.

6.2.2 Relationships between Variables

One of the principal issues which will need to be established is the identification of the cause of these improvements. Was the change due to the introduction of the logistics triad concept, was it to do with another extraneous factor, or was it to do with a combination of factors including the introduction of the logistics triad concept?

The methodology chapter discussed this issue introducing relevant terminologies. In summary the problem is this: how confidently can the conclusion be drawn that the dependent variable (an improvement in delivery performance over a two year period) be caused by the independent variable (in simple terms the formation of the logistics triad, which featured the development and adoption of a new more focussed, aligned and agreed measuring system); or are there extraneous variables (outside additional factors), which may provide an alternative explanation to the independent variable?

To reach the conclusion that the dependent variable was caused by the independent variable, three types of data were collected through the case study: performance data, opinion data and behaviour data. Again these three types were introduced in the Methodology Chapter. Performance data (hard quantifiable results) is clearly a core foundation of the analysis while opinion data (records of how respondents feel) and

behaviour data (records of how respondents act) are based on Dillman's (2000) classifications of data variables.

6.2.2.1 Performance Data

The objective of the focus on the triad was to improve logistics performance – in particular delivery of call offs on time and in full. The results recorded a marked improvement in performance from an average of 75% before the introduction of the triad trial to an average of 96% nine months after the trial commenced. This improvement was sustained when the triad was revisited after 24 months for the 42 weeks leading up to this 24 month review. However, although the timing of this improvement coincides with the launch of the triad and the new measuring system, it is not valid to conclude, based on these facts alone, that the introduction and development of the logistics triad featuring the new more focussed, aligned and agreed measuring system definitively caused this improved performance. As Dey (1993) points out: “the association of one variable with another is not sufficient ground for inferring a causal or any other connection between them”. Alternative explanations of association may exist, including an intervening variable, which may provide more valid reasons.

To further strengthen confidence in the association between the dependent and independent variables, the opinions from leading representatives of all three triad entities were sought at the nine month and 24 month reviews.

6.2.2.2 Opinion Data

The testimony of the operators and managers of the entities involved was an important component in shoring up confidence in the association between the dependent and independent variables. This was gathered through interviews carried out by the researcher and review meetings chaired by the researcher with representatives from all three triad members.

The Managing Director of the Consignee appeared to closely link the improvements to the successful introduction of the triad concept when he stated, “the project has brought about significant improvements in delivery performance and reductions in the associated management time and hassle associated with missed deliveries”. Similarly,

leaders from the LSP and the Seller also stated that there was a direct link between the performance improvement and the logistics triad concept. The Managing Director of the LSP stated, “one of the principal benefits of the research on the logistics triad was to highlight the weak link between the buyer and the logistics service provider...this has now been strengthened by “dropping the guard” between the two entities – the new openly communicated measure has helped to create this new culture”.

In addition to the interviews and review meetings, a follow up questionnaire (originally completed at the outset of the case study) was given to representatives of each triad entity at the 24 month review meetings. It sought to uncover how each entity felt about each of the other members of the triad. The results from this reported on in the last chapter served to further reinforce the conclusion that the introduction of the triad concept featuring in particular the new more focussed, aligned and agreed measuring system had been instrumental to changes in performance and also as a consequence to changes in inter-relations especially on the link identified as the weakest at the outset of the research between the LSP and the Consignee.

6.2.2.3 Behaviour Data

Finally, the actions of the three entities are reflected on to help further verify the relationship between the two variables. The interactive nature of the case study approach helped greatly in gathering evidence in this regard. A number of behavioural examples can be cited to support the conclusion that the formation of the logistics triad featuring the development and adoption of the new more focussed, aligned and agreed measuring system had an impact on delivery performance and on the development of greater trust and more collaborative relations.

Firstly, and perhaps most obviously, the operators for the LSP clearly took a renewed pride and interest in achieving an improved performance and sustaining it once the clear focus, value and visible appreciation for their role had been re-established. Beforehand, the research had found that there as a confusion around this area. Although all three parties purportedly were striving towards similar goals of improved supply chain performance, they were in reality measuring different things and were getting very frustrated with each other’s performance often incorrectly blaming one of

the other parties for problems which arose. The timing of the improved performance directly following the renewed focus was an important point.

Secondly, and linked to this, was the fact reported by the Consignee that far less time was spent having to sort out the frustratingly time consuming issues when deliveries went wrong. Because the logistics element of the supply chain became more dependable, time could be focussed on other supply chain matters.

Thirdly, a change which was palpable was the improved culture which existed between the representatives of the three entities in the logistics triad. This was particularly relevant to the relationship between the LSP and the Consignee, which had been found to be the weakest and most problematic relationship in the triad at the outset of the research study. This was now recorded as one of the strongest inter-relationships in the triad despite there being no underlying contract or formal relationship between the two entities.

Finally, the fact that the agenda of collaboration had moved on and the three parties were actively considering the feasibility and implications of joint investment proposals was a significant behavioural change. A good example of this was the joint focus given to the costs and payback potential on installing a new crane at the Consignee's site, which would allow larger coils to be used. Potential benefits would accrue to all three parties if this occurred – longer batch runs for the supplier and buyer and fuller payloads for the LSP (fewer journeys for the same tonnes of steel moved).

6.2.2.4 Potential Extraneous Variables

It should not be ignored however, that there were potential extraneous variables which might have impacted on the dependent variable. The steel market fluctuates markedly and lower volumes of steel being shipped between the Seller and the Buyer especially during the second measuring period (42 weeks up to September 2007) could have made the logistics operation easier and therefore less prone to problems. An additional reason for the fall in demand in this period came from the decision by the Buyer to source steel supplies increasingly from other alternative sources to reduce their dependence on this original supplier. However, conversely, volumes had markedly

increased during the first nine months when the improvement in delivery performance was first recorded. It would appear that the new ways of working were largely independent of volume changes.

Another extraneous factor, which will be discussed more fully later in this chapter, was the introduction by the Seller of a new structure for logistics outsourcing which was rolled out to this triad six weeks before the end of the second measuring period in July 2007. This introduced a number of changes but the performance of the LSP was maintained during this brief period of measurement at a high 90% level.

6.2.2.5 Conclusions

Whilst these and potentially other factors may have had some bearing, the performance, opinion and behavioural data suggests overwhelmingly that there was a strong association between the improvements in the performance of the logistics triad noted above and the formation of the logistics triad which featured the development and adoption of a new more focussed, aligned and agreed measuring system.

The concluding remarks from the Managing Director of the Consignee summarised the position accurately. “The project has brought about significant improvements in delivery performance and reductions in the associated management time and hassle associated with missed deliveries.....the new measurement system has remained robust throughout the two years since implementation despite volumes oscillating during this period”.

Reflecting on the first research question the conclusion reached in this discussion supports the view that in the example of this case study:

**“the logistics triad is a suitable unit of analysis
in supporting the role of modern outsourced logistics within the setting and
goals of supply chain management (SCM)”**

6.2.3 Generalisability

From a theoretical perspective this is a significant finding. However, to strengthen this conclusion, the important issue of generalisability of the research needs to be considered.

The research focused on a single longitudinal case study within the road freight logistics industry. Although the case was carefully selected as being, “not untypical” of many third party logistics operations – refer to the positioning of the case study within a range of categorising typologies for logistics service provision presented in the Methodology Chapter (Three) - models for logistics service provision clearly vary considerably. This could mean that the steps taken (around the renewed focus on the alignment of tripartite relations) and the consequent results achieved are not as readily attainable in other logistics triads.

This is important because although the findings are significant in explaining what is going on within the specific research setting of the case study logistics triad, even greater significance and generic value could be achieved if it could be proved that the findings could be translated to similar logistics settings. Although the idea of developing partnerships with third party LSPs has developed in recent years, the notion that relations and performance measurement should be shared on a tripartite basis is relatively novel.

Discussions around generalisation have been made in the methodology chapter and the conclusion reached that a single case study provides no grounds for any quantifiable generalisation, while a stronger argument exists for a qualitatively based generalisation especially with regard to the relevant logistics provider populations identified in the typologies in Chapter Three. Interestingly, in research presentations to practitioners the case study findings have provoked a good deal of interest and questioning. The problem of generalisability remains, however, a problem of single case study approaches.

To bolster the case for theory development and generalisability potential, the feedback from an audience of logistics professionals to structured questions is incorporated into this section. As discussed in the Methodology Chapter (Three) this **third phase** of the research stems from a major conference held in February earlier this year (2008) led by this researcher where this research and other related research findings were disseminated.

6.3 Phase Three of the Research: The Application of the Triad Case Study to the Logistics Industry

The audience size for the conference was just under 100 delegates and the structure of the audience during the second morning session, when the presentation of the findings from the logistics triad research in this thesis was made was as follows (Figure 54).

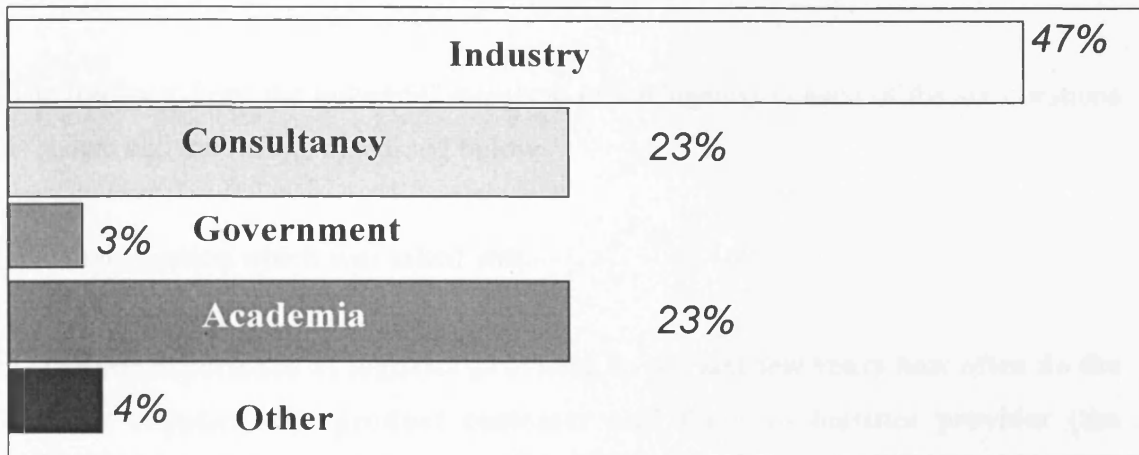


Figure 54: The Composition of the Audience at the 2nd Morning Session of the Belfry Dissemination Conference – February 27th 2008

The feedback from this audience to a series of related questions is important as they add weight to the potential external validity or generalisability of the research – “that is whether the findings are equally applicable to other research settings, such as other organisations” (Saunders et al, 2007). The inability to generalise is a weakness of the case study approach, as discussed in the Methodology Chapter. Whilst the purpose clearly is not to be able to generalise the findings, but to simply explain what is going on in the specific research setting, namely the logistics triad, in order to test the robustness of the conclusions it is useful to expose them to a wider logistics audience and gauge their reactions. The section of the audience which would provide the most valid feedback were those that were from industry (47% of the sample), so this group was asked whether they were principally providers of logistics, a customer of logistics, or another entity – their response is shown in Figure 55.

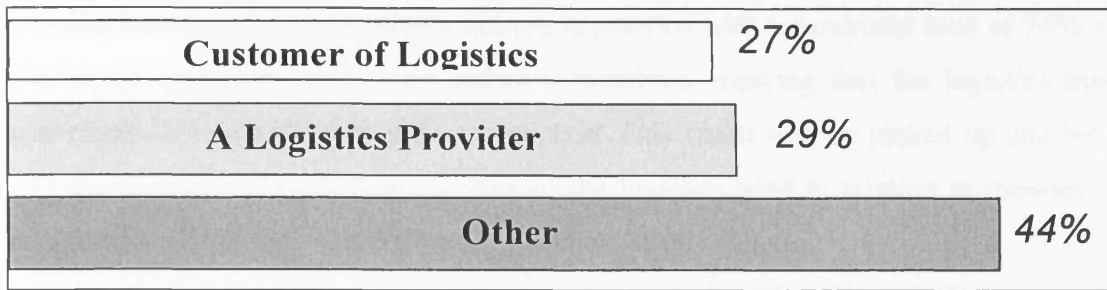


Figure 55: The Composition of the Logistics Industry Members from the Audience at the 2nd Morning Session of the Belfry Dissemination Conference – February 27th 2008

The feedback from the industrial members (47 delegates) to each of the six questions is shown and the results discussed below.

The first question which was asked was:

1. In your experience of logistics provision in the last few years how often do the product supplier, the product customer and the lead logistics provider (the logistics triad members) formally aim to align objectives and working practices?

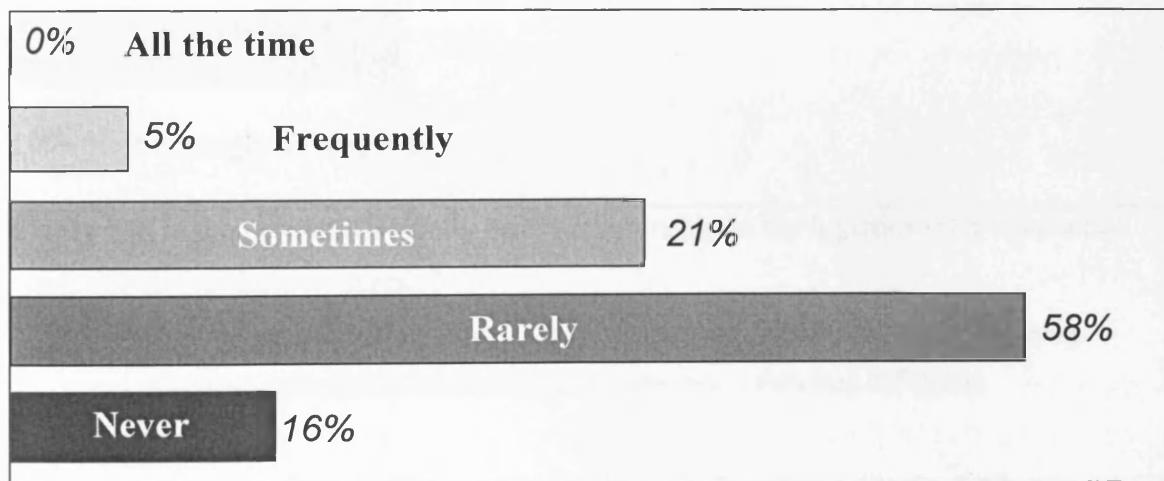


Figure 56: The Frequency that Logistics Triad Members Formally Align Objectives and Working Practices

(Feedback from the Logistics Industry Members from the Audience at the 2nd Morning Session of the Belfry Dissemination Conference – February 27th 2008)

The results from Question 1 (Figure 56) confirm the view that emerged from the Literature Review and the Exploratory study presented in Chapter Four, that the

logistics triad concept is relatively unique in practice with a combined total of **74%** of conference delegates, who were industry members, replying that the logistics triad was rarely or never used in their experience. This result will be picked up and built into the discussion on the significance of the logistics triad in relation to theories of competitive advantage in the following section of this chapter.

The second question asked:

2. Is the non-contractually based relationship in the logistics triad a potential weak link in the chain of supply? (The non-contractually based relationship was shown on a diagram of the triad as the inter-link between the LSP and the Consignee)

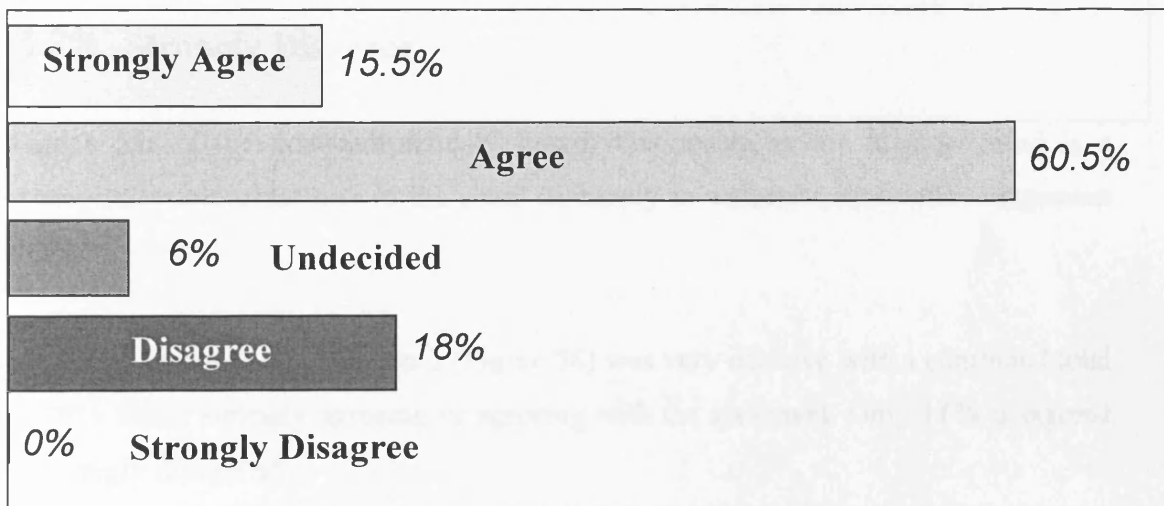


Figure 57: Is the non-contractually based relationship in the logistics triad a potential weak link in the chain of supply?

(Feedback from the Logistics Industry Members from the Audience at the 2nd Morning Session of the Belfry Dissemination Conference – February 27th 2008)

This result from Question 2 (Figure 57) provides confirmation with the finding in the Case Study that the third relation in the logistics triad is a potentially problematic weak link in the chain of supply. In total **76%** feedback that they either agreed or strongly agreed with the statement. Only **18%** disagreed, and no delegate strongly disagreed.

The third question asked:

3. Do you personally feel that the non-contractually based relationship in the logistics triad is a strategically important link in the chain of supply to warrant a renewed management focus?

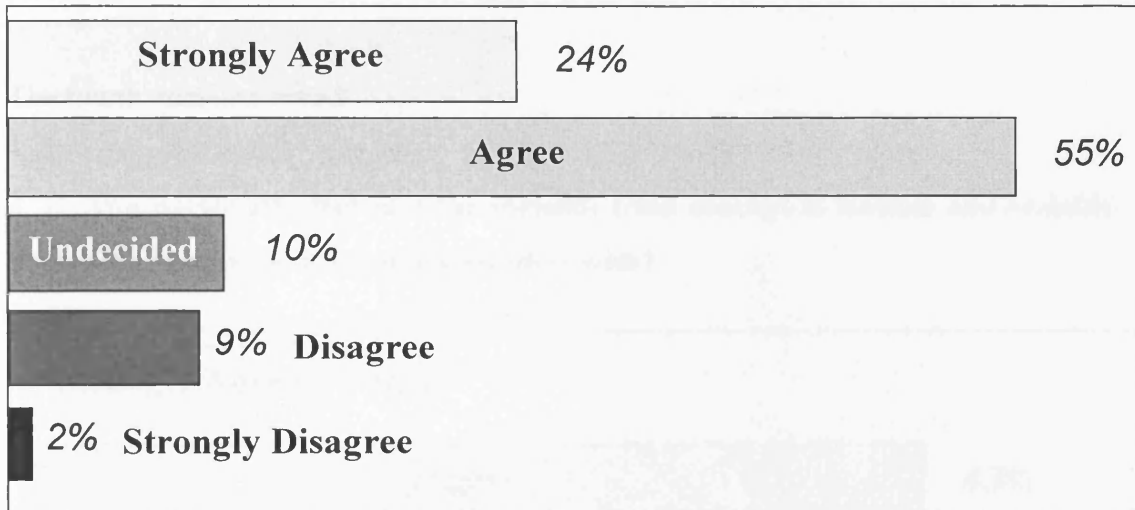


Figure 58: Is the non-contractually based relationship in the logistics triad is a strategically important link in the chain of supply to warrant a renewed management focus?

Again the feedback to Question 3 (Figure 58) was very decisive with a combined total of **79%** either strongly agreeing or agreeing with the statement. Only **11%** disagreed or strongly disagreed.

However, on closer analysis there was a clear disparity in response between the customers of logistics and providers of logistics. Whilst **81%** of LSPs strongly agreed (31%) or agreed (50%) and only **6%** disagreed (6%) or strongly disagreed (0%), this conclusion was much less decisive in the response of the customers of logistics. Here, only a combined total of **59%** strongly agreed (19%) or agreed (40%) while a much higher proportion of **33%** disagreed (27%) or strongly disagreed (6%) with the statement.

This is an interesting finding and appears to confirm some of the sentiments uncovered in the Literature Review and the Exploratory Study presented in Chapter Four that the customers of logistics can perceive their strategic priority to be outside

logistics itself and to be concerned about another supply chain issue. For LSPs however, as logistics is their business this may explain their stronger agreement with the statement. It also highlights that although logistics providers and their customers invariably cite similar supply chain goals of improving values for the end customer, in fact their strategic priorities can be different.

The fourth question asked:

4. Do you personally feel that the logistics triad concept is feasible and scalable across the supply chains you are familiar with?

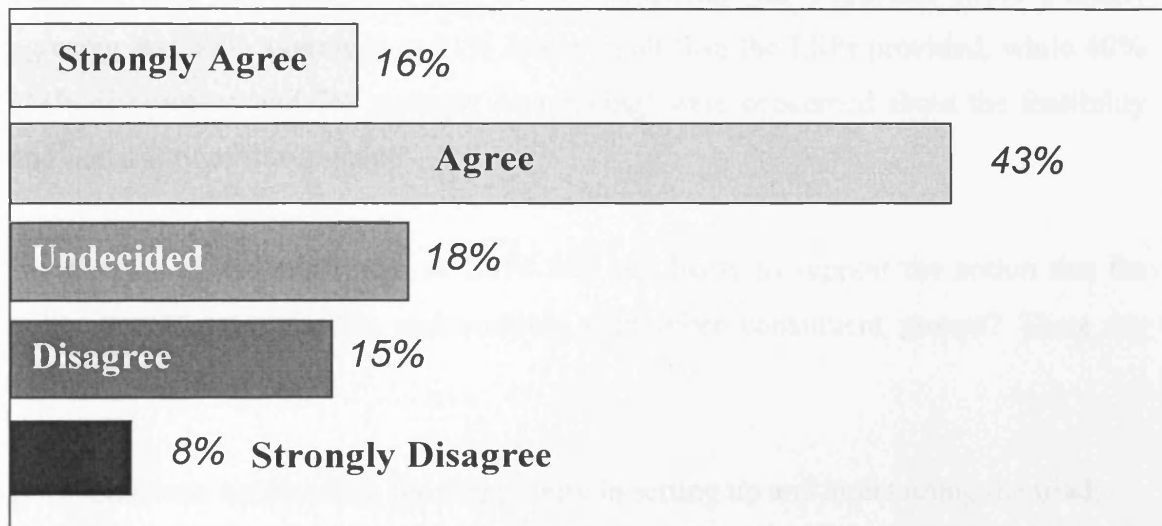


Figure 59: Is the logistics triad concept feasible and scalable across the supply chains you are familiar with?

Question 4 tested the perceptions of the delegates in determining the feasibility and scalability of the logistics triad concept. The setting for the research had deliberately been fairly traditional in terms of supply chain sophistication and complexity of logistics process. This had allowed the research to focus on whether the triad concept of aligning and maintaining relationships across the triad had any credibility at all. Whilst the research had supported the notion that the logistics triad was feasible in this context, for wider generalisability it was interesting to probe into how feasible and scalable the delegates felt the concept was in supply chains they were familiar with. Figure 59 indicates that in total a fairly substantial majority (59%) felt that it was feasible and scalable which was a strong endorsement that the triad concept had

relevance to the practitioner world and was perceived to be applicable in a variety of logistics settings.

Again there was an interesting divergence between the LSPs and their customers' feedback on this issue. In keeping with the response to the last question, the LSPs were on average much more optimistic about the feasibility and scalability than the customers of LSPs. For the LSPs a combined total of **68%** supported the statement (24% strongly agreeing and 44% agreeing) while only **19%** (13% disagreeing and 6% strongly disagreeing) had concerns about the feasibility and scalability in supply chains they were familiar with. For customers of LSPs the result was much less decisive with just less than half (**47%**) supported the statement (14% strongly agreeing and 33% agreeing), a 21% lower result than the LSPs provided, while **40%** (33% disagreeing and 7% strongly disagreeing) were concerned about the feasibility and scalability of the concept.

So why would the customers of LSPs feel less likely to support the notion that the triad concept was feasible and scalable than other constituent groups? There are various possible reasons.

- Δ Concerns surrounding the complexity in setting up and maintaining the triad;
- Δ The reluctance to give LSPs any more power in the supply chain – in the case study example the LSP in question was able to be more proactive and influential;
- Δ A lack of belief that the triad concept is required – this could be for various reasons including a view that the LSP is already performing well enough and the end-customer is already satisfied, or that the inter-dependence in the supply chain is as yet not sophisticated enough to warrant investment in the triad concept.

With the majority of the total audience (**64%**) responding that they strongly agreed (18%) or agreed (46%) that the logistics triad was feasible and scalable in supply chains they were familiar with in supports the view that the research findings have some generalisable applications. However, the smaller proportion of customers of logistics should be accommodated in any final conclusions drawn from the research.

Thee fifth question asked:

5. In logistics provision which business – business interface do you feel is the most problematic link of the logistics triad?

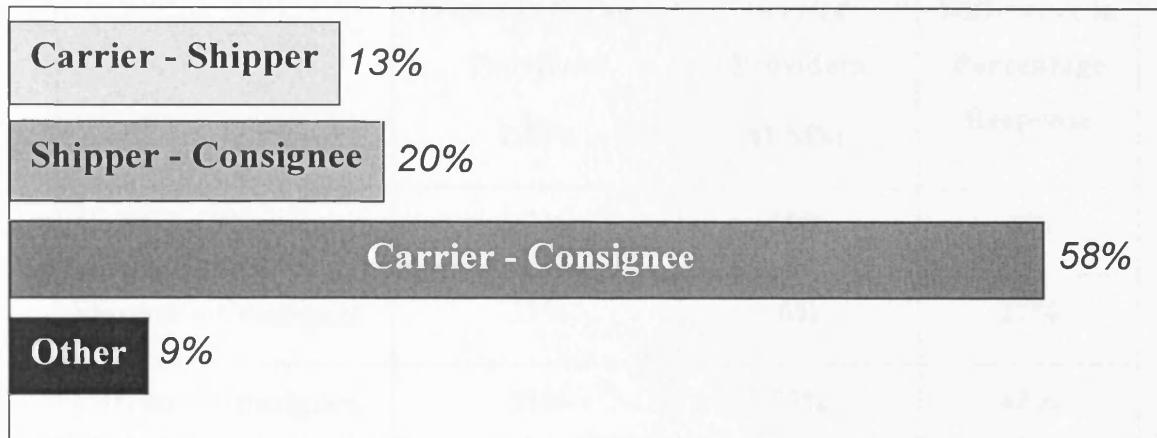


Figure 60: In logistics provision which business – business interface do you feel is the most problematic link of the logistics triad?

The response to Question Five (Figure 60) is very illuminating. The delegates clearly identified the Carrier – Consignee interface as the most problematic. This is not a surprise when viewed against the findings in the research on the case study but it is a different response than could have been expected before the research study commenced. The Literature Review and the Exploratory Study both highlighted that the inter-relations that receive most emphasis in the academic coverage and attention in the practical world are the other two relations in the triad. For both the research in the case study and the feedback on this questionnaire to both highlight that the third relationship in the triad between the Carrier and the Consignee is the most problematic, is most revealing.

A comparison of the results between the LSPs and the customers of LSPs is yet further revealing, and again highlights the different perceptions of the triad inter-relationships which exist between the two entities. The LSPs strongly identified the Carrier-Consignee relationship as the most problematic interface (75%) compared to the Carrier – Shipper (19%) and the Shipper – Consignee (6%) interfaces. The customer of logistics perceives matters very differently with a much more even spread

of responses – the Carrier – Consignee and the Carrier – Shipper both have a **33%** response rate whilst the Shipper – Consignee rate is very similar at **27%**. This comparison is summarized in Table 23.

	Customers of Logistics Service Providers LSPs	Logistics Service Providers (LSPs)	+ or - Difference in Percentage Response
Carrier – Shipper	27%	19%	8%
Shipper – Consignee	33%	6%	27%
Carrier – Consignee	33%	75%	42%
Other	7%	0%	7%

Table 23: A Comparison of the Percentage of Responses from LSPs and Customers of LSPs to the Question, “*In logistics provision which business – business interface do you feel is the most problematic link of the logistics triad?*”

What becomes clear is that the respective interfaces that the LSP and the customer of the LSP are not directly involved with (the Carrier – Consignee interface for the Shipper and the Shipper – Consignee interface for the LSP), is the link which scores a much lower percentage in comparison. This is highlighted in Table 23 where the differences in percentage response rate for each interface are shown. Perhaps this is intuitively what may be expected, but again it highlights that from the Shipper’s perspective care must be taken to ensure that if logistics provision is outsourced, the Shipper – Consignee inter-relationship is not problematic. After all, if the Shipper is the Seller of the goods (as in the case study example) this interface is the only physical link with the Buyer.

Finally, the sixth question asked:

6. Do you feel that the logistics triad alignment focus is a legitimate supply chain strategy which should be addressed by members of logistics triads?

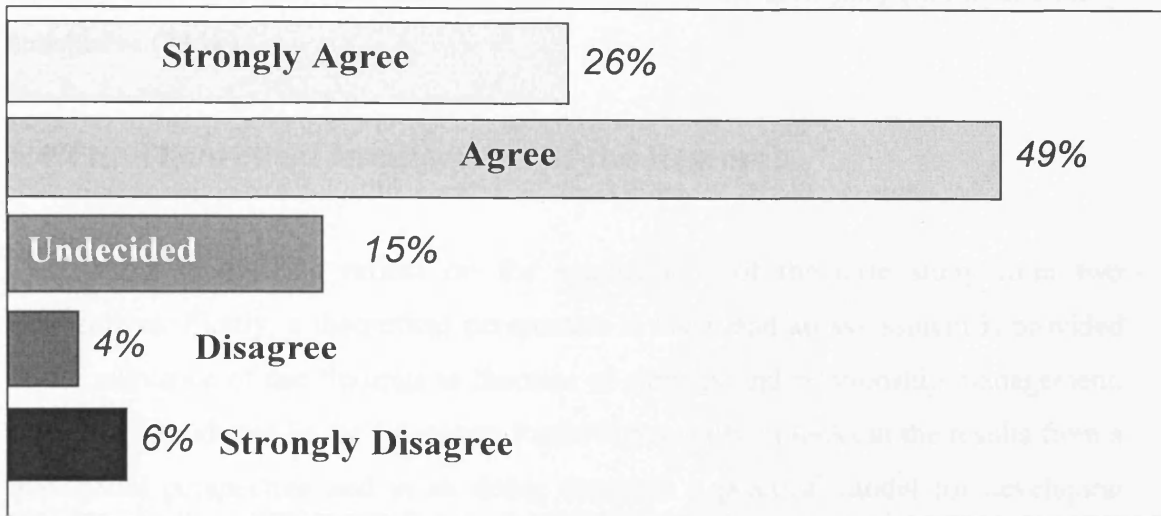


Figure 61: Is the logistics triad alignment focus a legitimate supply chain strategy which should be addressed by members of logistics triads?

Question Six linked the issue of the logistics triad to strategy formulation and implementation. There are many issues and causes which compete to be taken up strategically by a firm. For an idea to be felt to be important to be taken up strategically, senior managers have to assess whether it will provide a good return on investment compared to alternatives as there is a limit to how many strategic initiatives can be taken up at any one time. It is not enough strategically for an initiative to be just a good idea. It has to be accepted as one of the leading initiatives which will be one of the best vehicles to bolster a firm's competitive advantage.

The response rate from the conference delegates shown in Figure 61 confirms overwhelmingly that focussing on logistics triad alignment was a legitimate supply chain strategy which should be addressed by members of logistics triads. Three quarters of the industrial based delegates (75%) confirmed this (agreed or strongly agreed) with only 10% responding that they either disagreed or strongly disagreed with this thinking. This is a very significant finding and again underlines the importance and relevance of the research findings to the practitioner community.

There was only a slight difference of emphasis between the LSP's responses and the feedback provided by the Customers of LSPs. If a combined figure (agreed or strongly agreed) is calculated for the two sections of the audience, both total a fairly conclusive (73%).

6.4 The Theoretical Implications of the Research

The next two sections reflect on the implications of the case study from two perspectives. Firstly, a theoretical perspective is taken and an assessment is provided of the relevance of the findings to theories of strategy and relationship management, originally introduced in the Literature Review. Secondly, it looks at the results from a managerial perspective and in so doing develops a practical model for developing sustainable enhanced inter-relationships and performance for logistics triads.

6.4.1 Theories of Competitive Advantage

In Chapter Two a range of theories, which are advocated by academics to explain sustainable competitive advantage, were put forward. Competitive advantage is derived from creating cost or differentiation advantages whilst creating customer value (Barney, 1991; Prahalad and Hamel, 1990). Porter (1985) suggests that this can be derived from a firm's value chain in that it can contain differences to others. Now that the conclusion has been reached from the case study that the development and adoption of a successful logistic triad can result in improved performance, the question then follows whether the concept could therefore provide a source for competitive advantage? To explore how this manifests itself in terms of strategy, two frameworks – the Strategy – Structure – Performance paradigm and the Resource Based paradigm, introduced in the Literature Review, are related to the research findings.

6.4.1.1 Resource Based View (RBV) of the Firm

To reaffirm, the RBV identifies that competitive advantage can be derived from a firm's internal *capabilities* and *resources* as opposed to its product outputs (Barney, 1991). *Resources* are the firm's assets. These assets can be intangible and include

relationship qualities such as trust, commitment and cooperation developed through an inter-firm alliance (Webster, 1992). *Capabilities* are processes or routines – coordinated ways of managing the resources (Morgan, Strong and McGuinness, 2003) and a *competency* can be derived from the ability of a firm to manage a collection of these resources and capabilities better than another firm (Day, 1994). What is key is the uniqueness and the heterogeneity of the competencies; i.e. how rare are they and how easy are they to imitate?

In terms of uniqueness, the logistics triad in practice appears to be relatively rare. This is borne out by the paucity of coverage on the concept subject in terms of academic study, and the fact that there is little mention of the logistics triad in the trade press. This conclusion can also be confirmed from the response to the first question at the dissemination conference discussed above. The question asked delegates, “in their experience of logistics provision in the last few years how often do the product supplier, the product customer and the lead logistics provider (the logistics triad members) formally aim to align objectives and working practices?” Only a quarter, **26%**, answered that they frequently (**5%**) or sometimes (**21%**) experienced an aligned logistics triad while almost three quarters (**74%**) responded that they had rarely (**58%**) or never (**16%**) experienced the concept.

Resources and capabilities are more useful when they are rare and/or hard to imitate (Barney, 1991), so the second element pertinent here is the heterogeneity of the triad – the ease with which competitors can copy such an initiative. Sustaining competitive advantage requires the establishment of barriers which make copying difficult. Continuous improvement and innovation further sustains the advantage (Day and Wensley, 1988). Halldorsson et al (2007) cite Prahalad and Hamel (1990) in listing four barriers to prevent competitors from imitating a firm’s resources and capabilities: **durability, transparency, transferability and replicability**; and also cite Jap (2001) in stating that, “these attributes may also apply to inter-organisational arrangements”. The logistics triad concept, in the form observed in this study, can be assessed against each of these attributes.

△ **Durability of the Logistics Triad**

The triad trial continued successfully for twenty four months and therefore appeared to be fairly robust. There were various reasons for this: the development of a **virtuous**

circle which supported continuous improvement, the **simplicity of the change, senior management support and the ownership and reporting of the measure by the LSP.**

1. A **virtuous circle** of continuous improvement had been engineered in the relationships of focus in the logistics triad (Figure 62): improved performance and improved communication led to a more trusting and inter-dependent atmosphere, which in turn led to the capability to be more accommodating and flexible of the other party (parties), which in turn led to improved performance and so on. This cycle of improvement was visible in the tripartite relationship and also in some of the dyadic relationships in the logistics triad. This was borne out particularly in Relationship C by the willingness of the LSP to commence operations earlier on anticipated busy days and to accept urgent deliveries, and by the Consignee in providing longer delivery windows on busy days and in improving turn-around times.

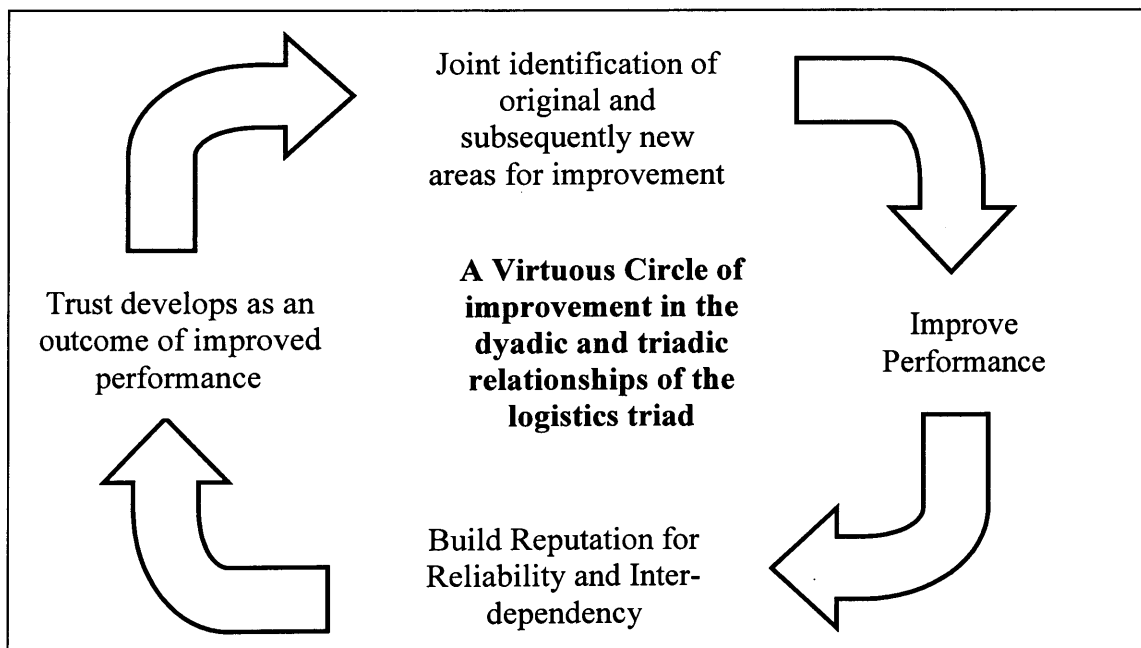


Figure 62: The Mutual Development of a Virtuous Improvement Cycle Built on Joint Identification of Improvement Areas, Improved Performance and thus Reputation and Trust leading to Further Improvement Opportunities and Closer Relationships

2. **The simplicity of the change** was an important factor in the durable success of the triad. The logistics triad is a more complex concept than the dyadic form of inter-relationship and therefore it is an art to make it operationally simple to achieve on a sustained basis. The initiatives adopted broke down this complexity and provided a simple yet enduring solution that was easy to understand from all perspectives. The key operational priority identified by all three entities in the triad was for the logistics operation to deliver reliably and consistently on time in full to support the SCM strategies for all parties. The actions adopted centred upon the dis-aggregation of production and distribution activities and the development of new shared measurement systems so that a clear focus could be placed on the LSP's performance. The research highlighted that the alignment of focus owned by all parties was vital. In this particular triad, these developments represented the keystone issues which provided a foundation from which many other benefits spun from.

3. **Senior management support** is recognised as being important in many change programmes. The issue has been discussed at length as one of the important reasons for selecting the triad discussed at the outset of Chapter Five, but their ongoing support can be seen as a critical ingredient in the durability of the logistics triad trial.

4. **The ownership and reporting of the measure by the LSP** - The issue of the leadership organisation is a pertinent matter to discuss here. In this study, through the facilitation of the research, the LSP took over the leadership role. However, a case could be made for any of the three entities assuming this role.

Δ **Transparency and Transferability of the Logistics Triad**

This refers to the degree which the triad concept is visible to competitors wishing to copy the initiative. Transparency and Transferability have various dimensions: first, how obvious would the pursuit of a logistics triad based initiative be to competitors; and second how easily would it be to understand or comprehend in order to transfer the required knowledge?

The development of an inter-firm capability such as inter-relationship is a fairly contingent and internal matter. It is contingent because whilst there are commonalities which can be translated across similar initiatives, its make up must in reality be tailored or customised to the particular supply chain and logistics triad entities. It is internal because most of the operation and perceptions of how the triad is progressing are held internally amongst members. This limits the degree of transparency. However, each member of the triad is also a member of other triads, so potentially practices and ideas may be transferred by any of the parties practicing in the triad to other environments - making the triad more visible than it otherwise may have been.

In terms of comprehension, as discussed above, the notion of a three way interface of relations is much more complicated than a dyadic relationship which has in itself proven to be a basis for competitive advantage. The triad is made up of four inter-relationships in total, three dyadic and one tripartite form, so the alignment of all these in support of a common aligned aim is a challenging and complex subject. From this perspective it could be seen as hard to comprehend. However, opposing this idea are some of the developments presented in this study where quite deliberately, in order to overcome the barrier of complexity, fairly simple solutions, such as the development and adoption of a new measurement system, have been deployed.

In conclusion, given the contingent nature and inherent complexity, the triad could be said to have a certain lack of transparency and transferability by competitors.

Δ Replicability of the Logistics Triad

In terms of replicability, much will depend on the structure, systems and people issues, such as power imbalances present in each triad. As stated above each triad will be very different due to the different ingredients of its constitution (including the members' resources, capabilities and competencies), so this would suggest that it would be difficult, if not impossible, to replicate entirely good logistics triad practice.

On the other hand some basic common issues and rules for starting, developing and maintaining a logistics triad can be worked up. Indeed, a possible tool to aid managers in this task is outlined later in this Chapter. So whilst there undoubtedly is a degree of difficulty surrounding complete replicability, some replicability should be achievable.

Finally, it should be emphasised again here that the optimisation of the logistics triad alone should not be the objective. The logistics triad concept should be employed to support the better optimisation of the supply chain system if a more sustained strategy is to be achieved.

In conclusion, it would appear that the development and continuous improvement of a logistics triad concept could form the basis of, or contribute towards, a sustainable competitive advantage strategy as the triad is fairly durable, has only a certain degree of transparency, is not that easily transferred and is also not easy to fully replicate. In the wider sense, if the logistics triad is seen to better support a SCM strategy, which was the situation in this case study, and the SCM strategy is the source of a competitive advantage, then the development of a strong logistics triad may be argued as capable of supporting, or contributing to a strategy of competitive advantage. In other words it becomes a competence which, when combined with other competencies, could potentially enable unique capabilities to be developed.

6.4.1.2 Strategy, Structure Performance (SSP)

An additional and complimentary explanation which is used to explain superior performance and potentially, provides a strategic explanation for supply chain configurations and its sub elements such as the logistics triad is the SSP paradigm. Where a firm has a close fit between its structure and strategy it is argued that it will out perform a firm without the same degree of alignment (Child, 1972).

In SCM this close fit can be summarised using Ellram's (1991a) description – she states that the idea behind SCM is “to bring together parties beyond the boundary of the firm.... to share the information required to make the channel more efficient and competitive”. So if a firm chooses to compete through the exploitation of “relational **strategies**” in a holistic way (Storey et al, 2006), the key is to build up effective relations (**structure**) with all inter-connected supply chain players to improve **performance**. This thinking supports the idea that in the logistics triad, relations not just between the Buyer and Seller and the Shipper and the LSP, but also the Consignee and the LSP are important components of an integrated supply chain strategy.

Bask, (2001) confirms this, highlighting that a myopic focus on just the principal dyadic relationships within the logistics triad between the Buyer and the Seller and the Shipper and the LSP are sub-optimal and inevitably lead to limited performance achievement leaving a gap between **strategy** and **structure** and consequently restricted **performance**. What is required is to accommodate the triadic relationship in SCM strategies.

“the dyadic relationship is inherently limiting and could lead to sub-optimisation”

Bask, 2001

To ascertain whether this view was also shared by practitioners, this issue was probed further into with the audience at the dissemination conference introduced above. Finally, the sixth question asked, “do you feel that the logistics triad alignment focus is a legitimate supply chain strategy which should be addressed by members of logistics triads?” In other words, if the **strategy** is to pursue a more aligned logistics triad **structure** would the delegates expect performance to improve?

The response from the delegates from industry when asked this question (Figure 61) indicated that exactly three quarters 75% agreed with this sentiment. This would suggest that further confidence can be placed behind this view.

In conclusion, the logistics triad can be seen as a venue through which participating firms can exploit joint learning, across each of the four inherent inter-relations to create uniqueness to support differentiation – the RBV view of the firm. In addition, if participating firms wish to compete through a strategy of integrated SCM then the inclusion of the exploitation of all the inherent relations across the logistics triad, thus aligning strategy and structure, could lead to better optimised performance. The inclusion of the logistics triad as a legitimate unit of analysis and structure to be managed within SCM thinking is an important theoretical finding.

The focus now shifts to the managerial implications. The practical follow up question which flows from this finding is how can a logistics triad be effectively managed? A range of some of the key features inherent in the success of the logistics triad are

discussed below, while a model based around the “virtuous circle” concept is built up as a practical tool which can be used by managers as a checklist in establishing and maintaining a logistics triad.

6.5 The Managerial Implications of the Research

This section principally addresses the second question: **How should a logistics triad be managed so that the inherent opportunities are realised and the barriers overcome?**

The aim of the logistics triad is to “create, encourage, and maintain value for the benefit of all three parties within an overall objective of enhanced supply chain value creation”. It has been shown that the logistics triad is a suitable unit of analysis within a supply chain setting and that if managed well has the potential to contribute towards a sustainable competitive advantage strategy based on process excellence in terms of integrated SCM. The section below takes lessons learnt from the three phases of research and develops a model which can be used by managers wishing to further exploit the potential inherent in better managing logistics triads they are associated with.

The model is divided into three stages: preparation, operational focus and strategic focus. Each will be discussed and developed in turn.

6.5.1 Triad Preparation

Certain conditions were laid out at the start of the research of the logistics triad case study which provided important foundations. These are briefly repeated here as they may have relevance to the establishment of other logistics triads by practitioners.

6.5.1.1 Dis-aggregation of Logistics and Production Activities

Prior to the research there had been considerable confusion in this area as discussed in Chapter Five. By deciding early on that the principal focus of the logistics triad was to focus in a united manner on logistics performance to support SCM goals, rather than

all three parties focussing on their own perspectives of holistic supply chain goals, a clearer shared goal of consistent and reliable delivery on time in full of call offs was able to be established for the logistics triad.

6.5.1.2 Clarify Roles and Responsibilities

At a very basic level, the renewed focus on the operation and the dis-aggregation of logistics matters from production helped to clarify all parties' roles and responsibilities in the triad. This clarification was recognised as a key issue as it clearly delineated where the LSP's responsibilities started and where they finished, a fact which had become blurred in all three parties' perceptions before the commencement of the triad.

6.5.1.3 Understanding the Supply Chain based Strategic Goals of the Two Other Triad Members

The Literature Review revealed how important it was for supplying organisations to understand the perceptions of value held by the customer. In addition, a wide spectrum of potential strategies to SCM, were outlined and the importance of ensuring inter-relationship management was aligned with the SCM strategy was confirmed.

However, for successful inter-relationship management, this does not mean necessarily that collaboration in the supply chain is just a one-way process in acting on these perceptions and developing improved value propositions for customers. Each dyadic inter-relationship in the supply chain is a two-way (not just a one-way) process exchange, with an element of mutual benefit derived for both. In the logistics triad, not only do all three dyadic inter-relationships have to be two-way processes, an extra tripartite inter-relationship needs to be managed. This places an onus on each of the triad members to understand the strategic objectives of the other two players as well as the objectives of each dyadic inter-relationship, specifically including the inter-relationship they are not directly involved in. They also need to be able to incorporate these aims within the jointly held tripartite objectives of the logistics triad.

As an illustration, the strategic objectives of each of the triad members in the case study are summarised below:

- Δ **Company A**, the Seller, was keen to explore how it could differentiate in terms of service (logistics enhancements fitted with this strategy);
- Δ **Company B**, the LSP, was keen to seek more of an influence on the supply chains in which they served and to take on more of a leading role to achieve value adding steps where they perceived they existed, thus making themselves more attractive to their immediate customers, the Shippers;
- Δ **Company C**, the Buyer, was keen to be able to better serve their customers and foresaw that having a more reliable supply capability was critical to this – reliable logistics provision was a key part of this strategy they perceived.

All three parties recognised the shift towards competing through supply chain competence and that effective and efficient logistics provision was a vital component of improved supply chain process performance. They therefore all bought into the strategic need to focus attention in this area.

6.5.1.4 Co-owned Measure

As noted in the research, each party prior to the research had their own performance indicator purportedly aiming to measure the same thing, but in reality measuring different elements of the supply chain process. One of the important early steps was to develop and agree a single co-owned measure for the logistics triad as a whole. Once all parties bought into this, focus was re-established and efforts made by any party to improve it became more motivated. Importantly the new measures adopted were felt by all parties to be firmly linked to their strategic goals of improved supply chain process performance.

6.5.1.5 The Treatment of all Parties as Equals

This was a key feature which the LSP in particular commented on as a core ingredient of success. This was unusual as there is invariably an imbalance of power in logistics triads. So whilst in this triad the equal standing of the three parties was engineered and sponsored by the research, in most triads relations are not equal. Larson and Gammelgaard (2001) found that power imbalances among the parties had a dampening affect upon the potential of the triad. One of the issues which will be suggested as an area of future research will be whether the triad concept would be

acceptable where one or more of the parties in the triad has more or less power than the other parties involved.

6.5.1.6 Set up a Management Framework for the Triad

This is a vital element of the triad. Various sub-issues need to be considered and resolved and are listed below:

6.5.1.6.1 The Question of Leadership of the Triad

As the logistics provider, the leadership of the logistics triad naturally fell to the LSP. In this case they took on the onus of developing a new measurement system, after taking on board their own needs and the concerns of the Consigner and the Consignee. The LSP also took on the responsibility of compiling the measure, checking with all parties on the exact cause of failure if a delivery was not completed in full and on time and communicating the measure weekly to all parties. In summary they owned, without imposing, the new focus on logistics performance.

However, this is a difficult role for the LSP to play. After all they are reporting to the Shipper. The challenges and opportunities this presents will be expanded on when the potential the scalability of the triad concept is considered in the next section.

6.5.1.6.2 Establishing a Review Framework

Enhanced visibility of logistics performance – the weekly reporting of the new measurement system together with the clear attribution of blame where any issues occurred (agreed by the relevant party before publication) helped to re-enforce the on-going attention to maintain the improved performance. This was all backed up by a programme of regular review meetings attended by representatives of all three triad members. In the interviews with the triads' leaders, this improved communication of achievements was seen as a vital component of the improved performance drive.

6.5.1.6.3 Senior Management Leadership

Originally, when charting out the critical founding components of the logistics triad case study, senior management support was identified as a key aspect. Senior Managers (the Managing Directors from two of the triad companies and a senior executive from the other), were very supportive of the project attending the

introductory and review meetings and being attentive to any reports that were produced. However, what was more important than just senior management support was senior management leadership.

Hines et al, (2008) emphasise the importance of senior management leadership in handling organisational change. Two of the authors they cite are useful here to underline the importance of this aspect.

First they cite Collins (1991) in his celebrated text on leadership, "Good to Great". Collins identified that great leaders are not ego hunters or personalities that steal the limelight, even though they probably are ambitious. Instead, "they channel their ego away from themselves and into the larger goal of building a great companytheir ambition is first and foremost for the institution and not themselves". This is critical as leaders of logistics triads have to be able to transcend perhaps even their own short term self interests to unlock the value inherent within them.

Secondly they cite Jim Womack, a leading figure in the lean thinking movement from a recent presentation he gave. He stated two issues that have pertinence to the debate here. Firstly, he felt that senior management leaders had three things to manage – the purpose, the process and the people. The purpose had to be clear, the processes specified, and the people fully engaged. Secondly, to achieve these three components, managers had to think horizontally, not vertically. The logistics triad is a horizontal process flow and thus needs to be lead and managed as such. This is a challenge for triads which comprise of three vertically organised functions or firms. What is required is effective negotiation by the triad leadership with the functional heads.

6.5.1.7 Summary

The summary above has highlighted some of the key preparation issues, which provided important foundations to the eventual success of the logistics triad case study trial. They can be used as an initial blueprint by managers seeking to embark on their on logistics triad models. Once preparation along the lines discussed has been achieved, interpreted to their contingent setting, putting the newly aligned triad into operation can proceed.

6.5.2 Operational Focus

The case study illustrated well that process excellence cannot be built up at the strategic level until the logistics process becomes operationally reliable and robust. Logistics provision is a service to support the supply chain. Therefore, as discussed in the Literature Review and the Exploratory Research Chapter (Four), value-adding steps to further enhance the logistics operation cannot take place unless the basics of this service are being performed at a high and consistent level. In the case study example, by focussing on the core operation first, a clear foundation for future improvement was able to be established.

In the logistics triad this is a three way process. Once a common purpose is defined and accepted, each party can play a contributing role. In the case study logistics triad the Shipper focussed on ensuring the steel coils called off by the Buyer were fully processed and available in the dispatch area, the LSP ensured each shipment went to plan and managed the new aligned, jointly owned measuring system, while the Consignee (who was in this case the Buyer), after feeding in what they valued and what they perceived were the main logistics problem areas, ensured that each delivery was received promptly and vehicle turn around rates were minimal. This renewed focus on the logistics operation was supported by the measuring system and a fresh higher level of communication – each week the performance was disseminated, each mis-delivery was probed into and the cause clearly established and attributed. Gradually, operational process reliability and robustness began to be achieved and confidence and trust between all three parties, but especially in the weakest link at the outset of the trial between the LSP and the Consignee began to be developed.

The virtuous circle outlined in the review of contributions to theory development above began to be built up. On the back of the initial progress and enhanced communication and inter-dependence, further operational developments were factored in and achieved which led to greater inter-dependence and trust. Examples of this included:

- Δ A revised procedure for handling urgently required deliveries;

- Δ Extended opening hours and earlier start by the LSP to handle higher volumes on busy days;
- Δ New delivery procedures, so that the problem of a load just being tipped with the Consignee not being notified was avoided.

After nine months a major review meeting was called, chaired and facilitated by the researcher. As was reported in the Results Chapter (Five), many of these operational improvements and the resulting enhanced inter-dependence and trust was acknowledged, and this provided a platform for more strategic developments to be explored and a new cycle of improvement was entered into.

6.5.3 Strategic Focus

The strategic level in the case study was characterised by a longer time frame of consideration, joint discussion about investments and potential payback returns, and more willingness to become empathetic to the other two parties strategic agendas.

In effect this evolution from fairly ad hoc, self centred and problematic relations to more formal, understanding and thoughtful three way partnership, mirrors the findings of academics who have studied organisational learning – for example Peter Senge in his work on the “Art and Practice of the Learning Organisation” – the Fifth Discipline (2006). Again this supports the view that if the logistics triad can develop beyond the operational level and can build in further improvements from a strategic perspective, it can use its competence in organisational learning to deliver strategic advantages.

In the case study logistics triad over the longer term of two years, the review of progress showed that operational improved performance had been maintained and that strategic moves such as the removal of an inventory holding warehouse at the Consignee’s plant had occurred without issue. There were still problems in some dyadic relations, but these typically concerned issues which were beyond the control of the logistics operation or the LSP. Operationally from the LSPs perspective they included the volatility of demand for logistics and the lack of predictability, and from the Consignee’s perspective, the unreliability of production forecasts; although the

reliability of deliveries had improved, the reliability of production remained a serious issue.

Finally, one of the biggest questions that emerged from the case study was how scalable the logistics triad concept was. By scalability, what was meant was not so much the generalisability of the idea, which has been discussed above, but whether a Shipper, who potentially could be linked to large numbers of triads conceivably with many different LSPs and many different customers, could operationalise a standard logistics triad blueprint across the whole of its organisation? Similarly the same question could be asked of the LSP and the Consignee.

This is a major area of future research. In summary, the potential would seem to exist to apply the triad further across each of the party's operations and other similar logistics structures. However, a triad is more complex than a dyad and scaling up such an idea would add even more complexity, so this does need more consideration and thought.

6.5.4 Conclusions

The new KPI system has exposed the actual logistics operation much more transparently. LSP integration does appear to support the competitive position of all of the supply chain partners. This list above provides a summary of some of the most important issues for management to consider in practice. A model summarising the three steps taken to support an enduring logistics triad in practice, Triad Preparation, Operational Focus and Strategic Focus, is shown in Figure 63.

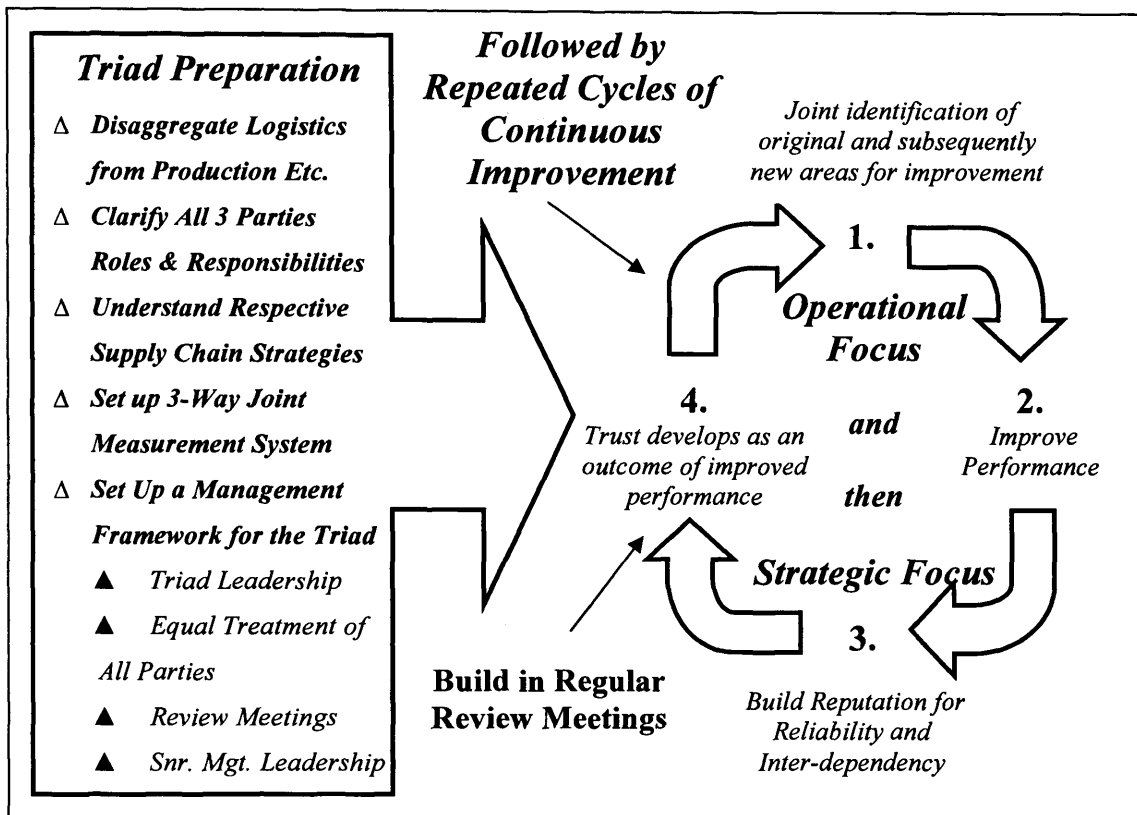


Figure 63: A Management Tool Modelling the Three Steps Taken to Support an Enduring Logistics Triad in Practice: Triad Preparation, Operational Focus and Strategic Focus

6.6 Chapter Conclusions

The freight transport operation is open to many “irritations” and the planning and execution of transport is generally managed under pressurised conditions with short lead times. In summary, by bringing all three parties in a logistics triad together to identify strengths and weaknesses in business relations on a tripartite basis and then pursuing a collectively owned improvement programme, performance and relations can be developed which can provide sustainable benefits to all three parties. This chapter has addressed the two research questions and shown that the logistics triad can be a suitable unit of analysis for logistics provision in the supply chain and provided a number of recommendations on how the logistics triad can be best managed.

The research has highlighted that a potential weak link in the chain of supply may exist due to the natural tendency of the logistics provider or carrier to work for the

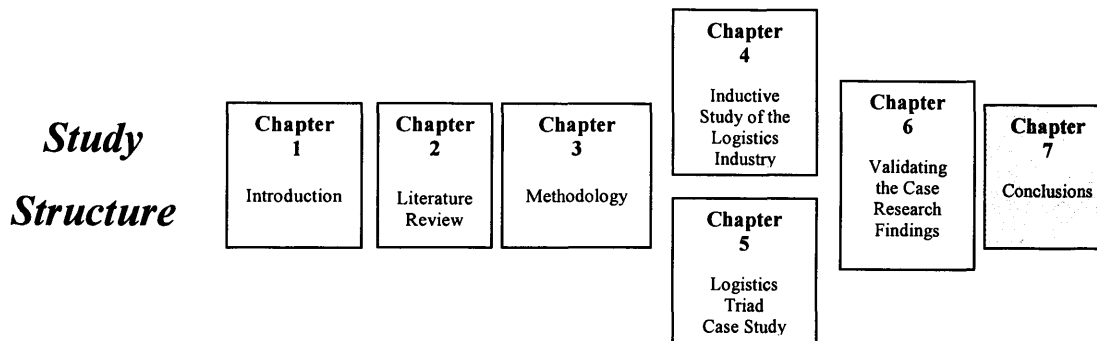
organisation it is contracted to, rather than both parties it is inherently connected to. It has shown that by exploiting its unique position between the Buyer and Seller the LSP can, if given the opportunity, lead the triadic partnership to a better performance for the benefit of all players involved, as Beier (1989) envisaged. The new KPI system exposes the actual operation much more transparently and can lead to continuous improvement and a virtuous circle of improved performance and relationships. It could be concluded therefore that the logistics triad concept could have implications for logistics partnerships in many situations.

Chapter 7

CONCLUSIONS

Chapter Aims

- Δ **Summarise main chapter findings**
- Δ **Present the principal contributions of the thesis**
 - **What is added to the body of knowledge**
- Δ **Discuss the implications stemming from the findings**
- Δ **Outline the limitations of the study**
- Δ **Present possible future research directions**



7.1 Introduction

Within the field of SCM, this work has focused on the logistics element, studying from both theoretical and practical perspectives the role of logistics provision in creating enhanced value propositions. In particular, it focused on relationship management and asked whether the “logistics triad” was an appropriate minimum unit of analysis for examining the role of modern outsourced logistics within the setting and goals of SCM.

This chapter will relate the findings back to the specific research questions and highlight the main contributions of the study to the body of knowledge. After a considered discussion of its implications, the limitations will then be set out. Finally,

concluding thoughts will be provided. To commence, a brief summary commentary of the respective inputs derived from each chapter is presented.

7.2 Chapter Summaries

Chapter One aimed to set out the backdrop to the study so that the contextual demands and challenges from the supply chain which LSPs operate within were better understood.

During the last few decades a fresh industrial environment has emerged, it argued. A key force in this evolution was the structural shift in the economy from “Fordism to post Fordism”, which was more associated with economies of scope rather than scale and flexible organisations through collaboration in economic networks. This emerging reality of the modern industrial environment has led firms in many sectors to rationalise the business focus on core competencies and outsource support services such as logistics provision.

Ultimately, firms now competed for business through their supply network, as supply chains increasingly competed with other supply chains for custom. Effective, efficient and relevant processes supported by appropriate inter-business relationships were demanded by supply chain partners with a supply chain orientation in striving to serve their customers better.

The chapter concluded by stating that the research would be centred on how third party LSPs were adapting to these challenges and opportunities. Relationship management would be an important aspect of the study, but not just the relationship the LSP has with their immediate customer, the Shipper, (although this was clearly of vital importance), but also with the Shipper’s customers across the logistics triad.

Chapter Two further developed the concepts of the supply chain and SCM. As noted in Chapter One, a strategy deployed by companies in many industries was to closely manage how they conducted their cross-functional business processes, both internally and externally. This inevitably included developing relations with business partners. It

highlighted that in freight distribution, as logistics service provision had become a popular outsourcing activity for many reasons, academic research had focused predominantly on the improved integration of logistics services within their specific supply chain network. Logistics had moved from being a liability to be managed, to a strategic asset which can represent a powerful source of potential competitive advantage, it concluded. A range of relevant theories, which underpinned the argument for closer relations between supply chain entities were set out.

Given this background of a shift in emphasis to a more process orientated approach where, the effectiveness of the whole (supply chain) was more important than the efficiency of any one part, it argued that it was therefore not surprising that third party logistics had changed in terms of criticality (strategic importance), content and complexity. Logistics provision had become a vital process in SCM in modern industries, where, integration of the supply chain had become an important way for industry to gain a competitive advantage. Rather than being a liability to be managed, logistics service provision in many sectors had become a potential source of competitive advantage, or at the very least a core building block, in developing a sustainable competitive strategy built upon supply chain excellence. The reliable operation of the supply chain system depended on the goods arriving consistently on time to the right place (time and place utility). This meant that logistics service provision was characterised as an integral process within the domain of SCM, and had to be ideally managed within the context and the demands of the supply chain setting.

The Chapter then explained why the logistics triad represented a core building block of logistics provision in the supply chain. It therefore supported the suggestion that supply chain business relationships involving logistics should be assessed and managed on *a tripartite* rather than a dyadic basis between all three inter-connected parties of the logistics triad, if an attempt to better optimise logistics provision was going to be realised. However, it noted that much of the previous logistics based inter-relationship literature centred only on the two-way or dyadic relationship between the Shipper and the LSP. Only a few studies had been undertaken addressing the logistics triad concept. Consequently a gap in the research was identified and the research aims which aimed to contribute to the plugging of this shortfall in the research and understanding in logistics triad concept were set out.

Chapter Three explained the background and detail surrounding the methodological decisions that had been made. It highlighted the importance of adopting a trans-disciplinary approach if the twin objectives in business research of achieving theoretical contributions for management and about management were to be realised. The aim of the study to provide robust learning and knowledge for both the academic and business communities was confirmed. An illustration of how this thinking has been adopted in this study is provided below showing how academic and empirical research and techniques have been combined by Chapter (Figure 64). Finally, the research methodologies to be adopted in each of the three phases of research, together with their strengths and weaknesses, were outlined.

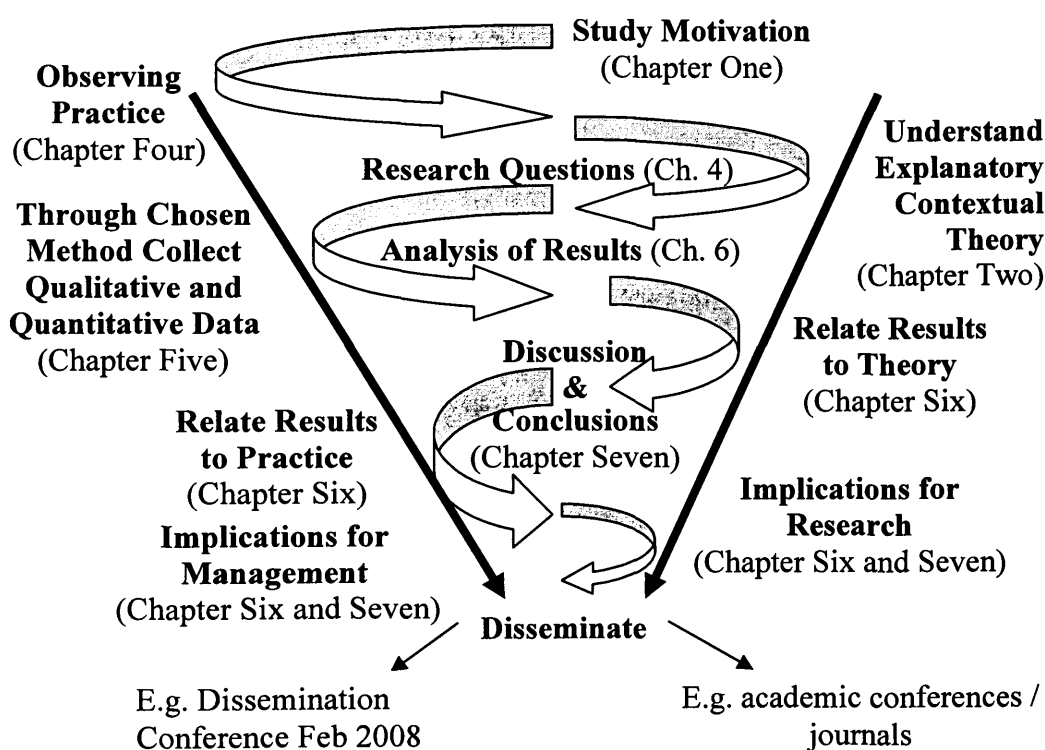


Figure 64: Producing Knowledge through a Trans-Disciplinary Approach – Applied to this Research Study

Chapter Four presented the inductive phase of the study combining empirical research in the field of logistics service provision with the critical Literature Reviews of Chapter Two. It had two principal aims; firstly, it aided the development of a fuller understanding of the issues and knowledge which surrounded the evolving subject of

inter-relationship management involving logistics in supply chain settings. Secondly, it helped refine the focus of the core research activity in the study, supporting the development of the principal research questions on the subject of the logistics triad. It showed that the steel sector was more traditional in SCM capability than the industry it was contrasted with, the grocery sector, and that LSPs are invariably not as integrated across the logistics triad as they could be in both sector scenarios.

The research then moved to the main body of the study, presented in **Chapter Five**, the longitudinal case study of a real logistics triad from its conceptualisation over a two year period. The study addressed the principal research questions and provided results which suggested that the logistics triad was a suitable unit of analysis when studying logistics provision in supply chain settings. It provided evidence that when all three parties involved in the logistics triad focused on aligned goals with clear and shared performance indicators, considerable improvements in logistics performance could be realised.

Chapter Six assessed the validity and generalisability of the research. First, the internal validity of the case study was presented. Although the longitudinal case study had shown a marked improvement over the two year period following the instigation of the triad concept, featuring an aligned and jointly shared new measuring system focusing on logistics performance, the causal link between the dependent variable (an improvement in delivery performance over a two year period) and the independent variable (the instigation of the logistics triad concept) had to be proved to be strong and not to have been caused by extraneous variables. This was achieved through triangulation of data, matching quantitative performance data with qualitative behavioural and opinion data. This indicated that the introduction of the logistics triad concept and the fact that it had been well maintained over twenty four months had directly led to joint focus on logistics operations, improved logistics performance and resulted in stronger inter-relationships in the triad, especially over the previously recorded weak link between the consignee and the LSP. The improvement in trust was particularly notable and signs that joint investment at a more strategic level were being jointly considered was highlighted. If a resource-based view of the firm was taken, it was argued in the chapter, this was providing evidence that through joint organisational learning and cooperation, competencies were being combined with

other competencies to form capabilities which could form the basis of a sustainable competitive advantage.

Second, the confidence with which the findings could be externally validated (or generalised) as being typical of other logistics triads was assessed. The point was made that the object of the thesis was not to quantitatively generalise the research. However, by arguing that the triad chosen was not untypical of many logistic triad scenarios qualitative generalisation (all be it with limitations) could be made. An additional piece of research where feedback was gathered from a professional logistics audience to questions derived from the logistics triad research further strengthened this qualitative generalisation proposition and the applicability of the findings to other logistics scenarios.

In this final chapter (**Chapter Seven**), the overall findings derived from the study are confirmed. These are listed as seven principal contributions which build upon the current body of knowledge. An exploration surrounding the implications of the research for both academia and practitioners is reflected upon. First the principal research contributions are presented in relation to the two principal research questions.

7.3 Principal Contributions

The main body of the study focused on what had become known as the logistics triad – the notion that in logistics provision, relationship management needs to move beyond the basic Carrier-Shipper partnership to also accommodate the inter-relationship both parties have with the third party. Consequently the study's purpose was to gain a deeper understanding of how misalignment of goals within the logistics triad, between the LSP, the Consignor and the Consignee, may impact on their inter-relationships and overall supply chain performance. Further, the research aimed to measure the impact of a re-focusing on collectively agreed goals across the triad. The contributions related to the two questions are set out below.

7.3.1 Contributions Related to Question 1

An indicative logistics triad in the steel industry was selected, and through a longitudinal case study a rich picture of the relative cultures, approaches to

relationships and organisational goals was built up. From this initial study, a number of changes were proposed and implemented. The impact of these changes on the triad after nine months and twenty four months was demonstrated using triangulated methods. The internal and external validity of the research was assessed in Chapter Six. The study was largely exploratory as very little research had previously been carried out on the subject of the logistics triad previously. A number of the derived findings were tested for significance and relevance with an audience of logistics professionals which indicated that the research was significant, had wider implications beyond the case study setting and was of interest to practitioners. Whilst there are limitations, which have been acknowledged and will be summarised in section 7.4 of this conclusion, a number of important statements of contribution to the body of knowledge can be made.

The principal contributions which relate to the first question of the **suitability of the logistics triad as a unit of analysis in supporting the role of modern outsourced logistics within the setting and goals of supply chain management (SCM)** are as follows:

1. The logistics triad should feature in conceptualisations of supply chains – With the majority of logistics provision now being managed on an outsourcing basis in many economies (for example in the USA, see Lieb and Bentz, 2005), the traditional conceptualisation of the supply chain by academics such as Harland (1996), which do not incorporate outsourced logistics provision, should now be replaced with models or frameworks which incorporate the logistics triad in the supply chain.

2. The logistics triad is made up of four relationships thus adding complexity to the SCM ideal - As the logistics triad comprises of three parties, there are, by necessity, four relationships to manage: three dyadic and one triadic. This leads to the conclusion that the integrated supply chain ideal promoted by SCM thinkers is more complex than just ensuring a series of dyadic inter-relations are managed and optimised. The logistics triad as a unit of analysis in the supply chain as well as incorporating four inter-relationships and aligning them with each other, includes the need to manage dyadic relations in parallel rather than in series and uniting three parties in each triad behind collectively held supply chain goals.

3. Not all the processes which run through the triad are the concerns of logistics

– There are many supply chain processes which primarily feature in the Buyer-Seller inter-relationship of the logistics triad, such as the issue of catalogue specifications and development, promotional planning, or new product development. However, some may have implications for LSPs. In summary, contingent to each logistics triad scenario, a spectrum can be charted concerning the degree of involvement of the LSPs in the decision making connected to these processes. Some will require no input, while others will require more joint consideration on a three-way basis. What is important is that logistics provision should not be a forgotten factor in the primary supply chain processes. A presentation at a recent steel conference summarised the issue well.

“logistics should have a voice in SCM if not a vote” (Orellana, 2008).

It is therefore important to be very clear about the type of issues the LSP should and should not be involved with and the timing and level of their influence and involvement.

4. A weak link in the supply chain can emerge between the LSP and the Consignee if the logistics triad is not managed appropriately – Invariably, there is no foundation of a contractual base in the third relationship of the triad between the LSP and the Consignee. Although according to Relational Contract Theory this should not matter, as contracts can be flawed anyway due to their inability to incorporate social exchange (MacNeil, 1985), the lack also of economic exchange places this interface at risk. SCM theory requires all inter-relationships in the chain of supply to be strong so this can place a problematic burden on efforts to better optimise integrated SCM practice. This was endorsed in the findings of the research, which found at the outset of the longitudinal case study that this interface was, by some way, the most distrusting and frustrating inter-relationship from both the LSPs and the Consignees perspectives in the triad.

5. Jointly aligning objectives and measures across the triad can lead to improved performance – By bringing all three parties in a logistics triad together to identify

strengths and weaknesses in business relations on a tripartite basis and then pursuing a collectively owned improvement programme, performance and relations could be developed which provided sustainable benefits to all three parties in the triad.

6. The LSP can play an important leadership role in the triad – In the logistics triad in the case study, the importance of the LSP in developing their role as supply chain leaders linking Consigners and Consignees together more effectively was a critical component of the triad's success. It is acknowledged that this invariably is not easy, as by their very nature of business LSPs are providing a service. Hence it is an alien behaviour to simultaneously orchestrate the other members of the triad. They are also only involved in a limited range of supply chain processes which run through the triad. However, they have a unique insight into many issues which add value or create wastes in logistics provision across the triad and therefore it is in the triad's interests that the LSP is able to be proactive and assert its views with other triad members. This finding confirms and builds on Beier's view, when he originated the logistics triad concept in 1989: - *"because the carrier views the transactions from a unique perspective different from either of the other two parties, it may be able to identify and pass on information which could lead to more efficient transaction processing between them"* (Beier, 1989)

7. Improvements in the performance of the triad can come from changes in any elements of the triad – In the case study, as discussed above, one of the principal advances came in the inter-relationship between the LSP and the Consignee. Success in an alliance depends on the partners having a clear vision of the future (Spekman et al, 1998). By creating a clearer vision and following it through, a substantial advance was achieved. This was instrumental in improving performance of the whole triad. It endorses the view that improvements in one facet of the triad can lead to overall increases in performance. However, the word can is vital. What is important is that the overall triad is enhanced, as indicated through jointly held measures, and not just improvements in one aspect which might ironically damage the overall triad performance. Indeed, a wider point needs to be reinforced here – the overall improvement in the supply chain in improving value for the end customer is the ultimate goal – if an advancement in the triad leads to a fall in overall supply chain performance, then the advance should also be reconsidered.

In conclusion, it is clear from the research that in addressing the first question the **logistics triad is a suitable unit of analysis in supporting the role of modern outsourced logistics within the setting and goals of supply chain management (SCM).**

7.3.2 Contributions Related to Question 2

In terms of the second question, **how should a logistics triad be managed so that the inherent opportunities are realised and the barriers overcome**, a menu of pertinent factors were outlined in Chapter Six based on the findings of the case study. They were summarised in Figure 62 which is repeated here for ease of reference (Figure 65).

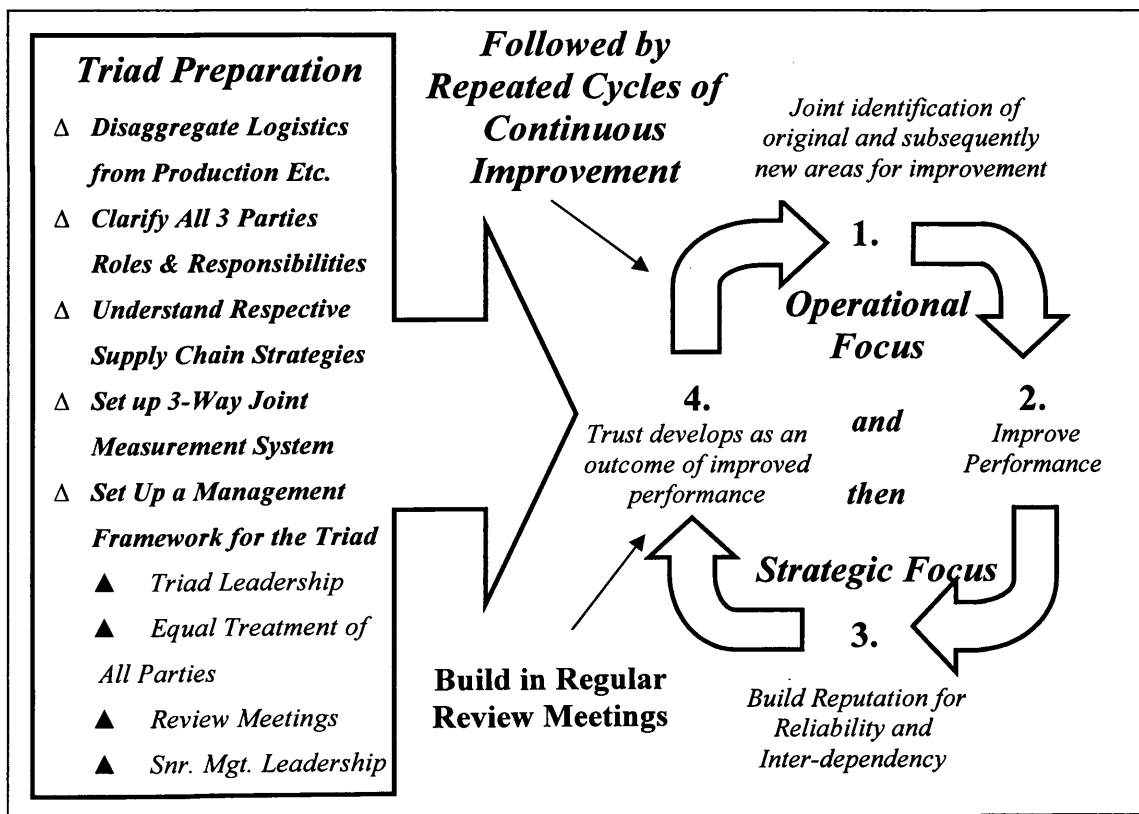


Figure 65: A Management Tool Modelling the Three Steps Taken to Support an Enduring Logistics Triad in Practice: Triad Preparation, Operational Focus and Strategic Focus

In essence, a project plan was devised which proposed that a logistics triad launch and development should be considered over three stages:

- △ **the preparation stage,**
- △ **the operation stage and**
- △ **the strategic stage**

If managed properly and positive results achieved, a circle of continuous improvement could be realised.

7.3.3 Main Contributions Conclusions

The research addressed the two research questions. The success recorded in the longitudinal case study confirmed the view that the logistics triad was a suitable unit of analysis of logistics within the supply chain, and provided valuable insight which allowed a framework to be developed to help managers in exploiting the benefits and overcome the barriers inherent in the logistics triad concept. It showed that it was possible for three parties to overcome their own self-centred interest and come together in an aligned manner over a protracted period to achieve sustained performance advances.

What was tangible was the cultural change, especially in relations between Company C and Company B. This was significant as it is a form of cultural reengineering of the business process which, according to Kurt Salmon Associates (1993) represents the largest challenge: “the biggest barrier to alliance success is organisational (culture and reengineering the business process) rather than technical or financial”. (Kurt Salmon Associates, 1993)

The research concurs with the findings of the only previous fully empirically based research study on the logistics triad concept by Gentry (1996) who concluded that if, “the buyer-seller partnership also included the carrier then this multi-firm alliance could be viewed as a segment of the overall supply chain” (Gentry, 1996). It has confirmed that sustainable gains can be generated if logistic relationship management

is repositioned from a dyadic to tripartite form. The logistics triad provides a great source for potential development:

Δ **scope for Shippers to improve their overall value package (logistics competencies can be an important aspect of differentiation and thus can contribute to a competitive advantage strategy);**

Δ **scope for LSPs to improve their capabilities and competencies, their value to the Buyer – Seller inter-relationship, as well as their integration into the respective supply chain, thus strengthening their own competitive position,**

and

Δ **scope for the Consignee to improve the value supplied to them.**

To conclude, a paragraph originally presented in the Literature Review would appear to have been endorsed by the thesis and brings together the principal findings and issues.

“One of the ways it is advocated that the supply or value chain can be better managed is through the, “integration of the primary supply (or value) chain activities into a seamless process” (Lummus et al, 2001). In basic terms this ideal has become synonymous with the notion of SCM which has attracted increasing levels of interest from practitioners and academics in recent decades. As highlighted above, a constituent of any supply chain where logistics is outsourced is the logistics triad. Therefore, if an entirely “seamless process” is to be realised it suggests that the effective management of the whole logistics triad, not just some of the inter-relationships inherent within it, is important. The goals of SCM must cut through the logistics triad and pervade all aspects of decision making within it if the ideal of a totally seamless process is to be achieved. At the very least all the relationships in the logistics triad must exist within the contextual setting of the contingent SCM strategy.”

At the outset of this research study it was noted that,

“competitive pressures on all supply chain actors could be considerable in the modern business era and this applied as much to the role of the LSP as to any other supply chain player. How LSPs, together with their customers, are responding to this, striving to provide enhanced value for their customers and sustaining their own business operations would be the overriding objective of the research”.

This has been the theme throughout the study which has bound together the issues raised, researched and discussed. As the thesis has evolved these words have also proved to be prophetic – over the course of the study, and especially over the last year, the competitive climate has become even harsher in many sectors combined with unprecedented increases in many commodity prices notably, with reference to this study, fuel, steel and food prices.

The principal findings and the implications of the study to practicing managers connected to logistics provision discussed in the last chapter show that at a time when there is a great appetite for novel ways further value can be extracted from supply chains, the exploitation of the logistics triad concept could become an eagerly explored idea. Certainly, the feedback from the audience of logistics professionals indicated there was a keen interest into the applicability of the concept to their contingent situations. This section will reflect and build on this conclusion and consider the applicability of the triad to logistics scenarios other than the one featured in the case study.

The field of outsourced logistics is maturing. As this occurs, the constituent elements of logistics provision, planning, operating, controlling and supply chain development, are breaking down into distinct components. In many instances, LSPs are specialising into one or more of these components and combining with other LSPs to offer more complete logistics packages. As a result the structure of logistics provision is becoming more complex with the emergence of, for example, fourth party logistics providers (4PLs). This poses a real challenge to the ideals of SCM which suggests that each inherent supply chain relationship should be strong and integrated.

This study has argued that in logistics provision the dyad has become an incomplete unit of analysis and there now is a clear need to incorporate the three way relationship of the triad.

7.4 Limitations

Despite a rigorous research process (set out in detail in Chapter Three), which has been followed throughout the thesis, there are inevitably limitations to the findings due to the weaknesses inherent in research design and methodologies adopted. It is important that these are clearly set out and reflected upon. Many of these issues have been introduced during the study, and a summary of the key limitations are discussed below.

One limitation concerns the internal validity of the case study research. As cited in the study:

“How confidently can the conclusion be drawn that the dependent variable (an improvement in delivery performance over a two year period) be caused by the independent variable (in simple terms the formation of the logistics triad, which featured the development and adoption of a new more focussed, aligned and agreed measuring system) or are there extraneous variables (outside additional factors), which may provide an alternative explanation to the independent variable?”

Three types of data, performance data, opinion data and behaviour data were used to strengthen the argument behind this causal link, but it was acknowledged that, as in any inter-relationship scenario, there are many extraneous circumstances which may have also had an influence. To understand these surrounding issues as fully as possible, the case study methodology allowed for a close consideration of reality to be realised by the researcher and the previous exploratory inductive research facilitated a more fully developed feel of the social context to be established. Nevertheless, further validation of the findings through replication of the study in research of other logistics triads would further validate this causal link and the findings of the thesis.

It should also be noted that in acting as a facilitator, the researcher inevitably bore some influence on the conduct of the participants in the longitudinal case study. Whilst the logistics triad concept was predominantly owned by the three parties involved and every effort was made by the researcher to be objective, by acting as a facilitation agent coupled with the fact that the researcher inevitably was an additional external player, the case study was in many ways unique. Care should hence be taken in assuming that a similar initiative, without the presence of a facilitating researcher, would necessarily achieve comparable results.

A further limitation concerns the external validity of the study. By focussing on one case study, the argument that this is not generalisable to the wider population of logistics triads in other scenarios must be faced as a potential limitation. Firstly, it should be made clear that the object was not to be able to quantitatively generalise from one case study. The object was more descriptive in nature – to better understand the issues involved in successfully managing a logistics triad and to evaluate whether a logistics triad was suitable as a unit of analysis at all. As little previous work had been conducted empirically in this area, the exploratory nature of the research justified the approach in terms of new knowledge creation.

It should also be noted that in selecting the steel sector, which, as was endorsed in the findings in Chapter 4, is an example of a more under-developed industry from a SCM perspective limitations in being able to directly translate the findings to other more advanced SCM sectors exist beyond the problems of generalizing from single case studies.

However, to generate more confidence that the research had implications to the wider population, Phase Three of the research was carried out. The qualitative feedback and quantitative responses from an audience of logistics professionals to set questions relating to the research findings strengthened the argument that there was external validity in the research to the wider populations.

Nevertheless, it is understood that there are a wide range of different logistics scenarios, some of which have been touched on within this thesis, so further research to test the findings in other logistics structures would again further validate the

findings of this research in terms of generalisability. The triad represented was normative, in the sense that it was chosen to provide general understanding and indicate some of the underlying principles. Actual logistics triads vary dependent on their contingent circumstances and evolution and thus wider examination of the applicability of the findings to other settings would be recommended.

By combining research approaches it is hoped that the findings of the study have been strengthened and despite the inherent limitations that exist within any methodology design, the contributions made have good validity support to make them a satisfactory contribution to knowledge in the topic domain of inter-relationship management involving logistics provision.

7.5 Future Research

As an exploratory piece of research in a relatively un-chartered research field, the findings of the study give rise to a large range of potential avenues for future research. Constraints of scope, time, finance and access prevented many of these topics being pursued in this study. A summary of possible future areas for research enquiry are provided here. To structure the presentation of this section, a range of high level questions are suggested.

7.5.1 When should a Logistics Triad be Applied?

Although the research in this thesis has argued that it could form or contribute towards a strategy of competitive advantage more research showing when this would be more or less appropriate would be of interest. For example:

- Δ Is there a difference between situations where the supply chain is more integrated and inter-dependent compared to a more conventional functionally oriented structure for example?
- Δ Is Bask's (2001) argument that there should be an alignment between relationship level or type and the complexity of the logistics operation, applicable to the logistics triad or are there other influential factors such as

asset specificity (Halldorsson and Skjøtt-Larsen, 2004) or criticality of logistics operation to the overall supply chain strategy?

- Δ Should the decision to adopt a strategy to pursue a logistics triad alignment be linked to the level and scope of relationship developed between the Buyer and the Seller of the product. For instance, Whipple and Russell's (2007) study of CPFR practices in the grocery sector classified collaborative ventures into a typology of three types; **Type I: Collaborative Transaction Management**, **Type II: Collaborative Event Management**, **Type III: Collaborative Process Management**. Is the logistics triad equally applicable in all three classifications?
- Δ Is the logistics triad a legitimate strategy to follow when logistics provision is structured around a 4PL (also known as lead logistics providers – LLPs - or logistics service intermediaries – LSIs – (Stefansson, 2006) business model? Further to this a range of spin-off questions emerge.
 - How can the lead logistics provider gain a feel of service to the Consignee when they are removed from the physical operation?
 - How can all relationships across the triad and constituent relationships with the physical LSPs be managed – are there inherent weak links present as many of these interfaces do not have a contractual base as was observed in the case study triad between the LSP and the Consignee: for instance in the 4PL structure there is not even a contractual base between the Shipper and the LSP as the contract the LSP has is with the LLP not the Shipper – does this matter?
 - To what extent is the potential for conflict between the Consignor and the LLP reduced as the LLP no longer has physical assets to be concerned with as noted by Sheffi (1990)?
- Δ Given the assumptions made in this thesis – summarised at the outset of Chapter Two are the findings equally applicable to other logistics scenarios? (where, for example):
 - Logistics provision is organised as an in-house activity by either the Buyer or the Seller
 - Logistics provision is organised by the Buyer and therefore the Consignee is the Seller
 - Logistics provision is handled by more than one player across a triad

- Logistics provision involves more than just physical movement – i.e. logistics activities over an extended supply chain including warehousing, light processing, packaging etc.
- Logistics provision is organised between two functions of the same firm etc.

7.5.2 How Should the Logistics Triad be Applied?

The research has argued that an alignment of objectives and measures is important, supported by leadership from senior managers and the LSP. However, many questions surround how this may be best achieved.

- Δ In dealing with organisations, one has to consider both the organisation and the individual “gatekeepers” (Den Hartog, 2003). What happens when personnel change in one of the firms of the triad as often is the case in organisations?
- Δ How important is it to have a supporting and aligned corporate culture across all three members of the logistics triad? It is interesting to reflect here that Ireland and Bruce (2000) and Barratt and Green (2001) argued some organisations are not capable of supporting collaboration, because they are very functionally orientated.
- Δ How can the lessons of the case study be scaled up across the whole operation of:
 - An LSP?
 - A Shipper?
 - A Consignee?
- Δ How should “mutuality of benefit” between partners be managed? Should all parties derive equal benefit, or is it satisfactory that all parties derive some, yet unequal payback for investing in the triadic relationship?
- Δ How should risk sharing across the triad be managed?

7.5.3 What are the Potential Implications of the Collaborative Logistics Triad?

It has been argued through this thesis that the triad concept should be managed and understood within the overall setting of the modern industrial landscape which exists today, and the contextual supply chain setting each contingent triad is enmeshed

within. If the importance of the triad is accepted as an important unit of the supply chain, what are the practical and academic implications of this development? For example:

- △ What is the practical impact of the collaborative logistics triad on holistic supply chain competitiveness?
- △ What are the practical implications on the role of the LSP if the collaborative logistics triad is more fully accepted by Buyers and Sellers?
- △ What should academics do to accommodate the collaborative logistics triad in conceptualisations of the supply chain and in describing how SCM is ideally pursued?
- △ What performance measures are most appropriate to be jointly shared across the collaborative logistics triad?

As in all research which encompasses subjects such as inter-relationship management and a process based approach to industrial design, the breadth, depth, and complexity of potential lines of further enquiry are manifold. The discussion above has given a brief description of some which may aid future research enquiry programmes.

7.6 Final Conclusions

7.6.1 The Originality and Value of the Study

The logistics triad, as it has become known, has been largely under-researched. For example, Larson and Gammelgaard (2001) refer to Gentry (1996) who observed that “virtually no research addresses the three way linkage of the transportation provider between supplier and purchasing firms”, and we, along with other authors, have identified only a few related subsequent studies (Stefansson, 2006).

This study has focused on this void with the purpose of gaining a deeper understanding of how misalignment of goals between the three players may impact on their inter-relationships and overall supply chain performance.

The complexity of the phenomenon under investigation has required that the study has drawn on a wide theoretical and practical knowledge base and background. The research has thus also been able to contribute to existing knowledge in a number of theoretical areas as well as in practice. It has contributed to competitive advantage theories such as the resource based view of the firm and the strategy, structure, performance paradigms as discussed in Chapter Six. It has provided a new knowledge base surrounding the logistics triad in the academic literature as described in the principal contributions in this chapter. And it has provided an improved understanding for managers of how a logistics triad can be best managed, discussed at length at the end of Chapter Six.

Inter-relationships are highly complex when conducted on a dyadic basis. They are wide-ranging, often conducted over many processes, strategic, tactical and operational in nature, short, medium and long term in nature, involve hard quantifiable aspects as well as softer more qualitative judgements, are dynamic, involve corporate culture and personal trust and are a relatively new concept which theorists are just beginning to understand and respect as being important in modern business practice. This study has sought to broaden this domain, and argue that logistics provision should not be confined by this dyadic approach, but instead should be considered on a tripartite approach across the logistics triad. It is hoped the insights provided will have applications and benefit to academic and practitioner communities alike and another strand to the understanding of logistics provision and the SCM debate will have been added.

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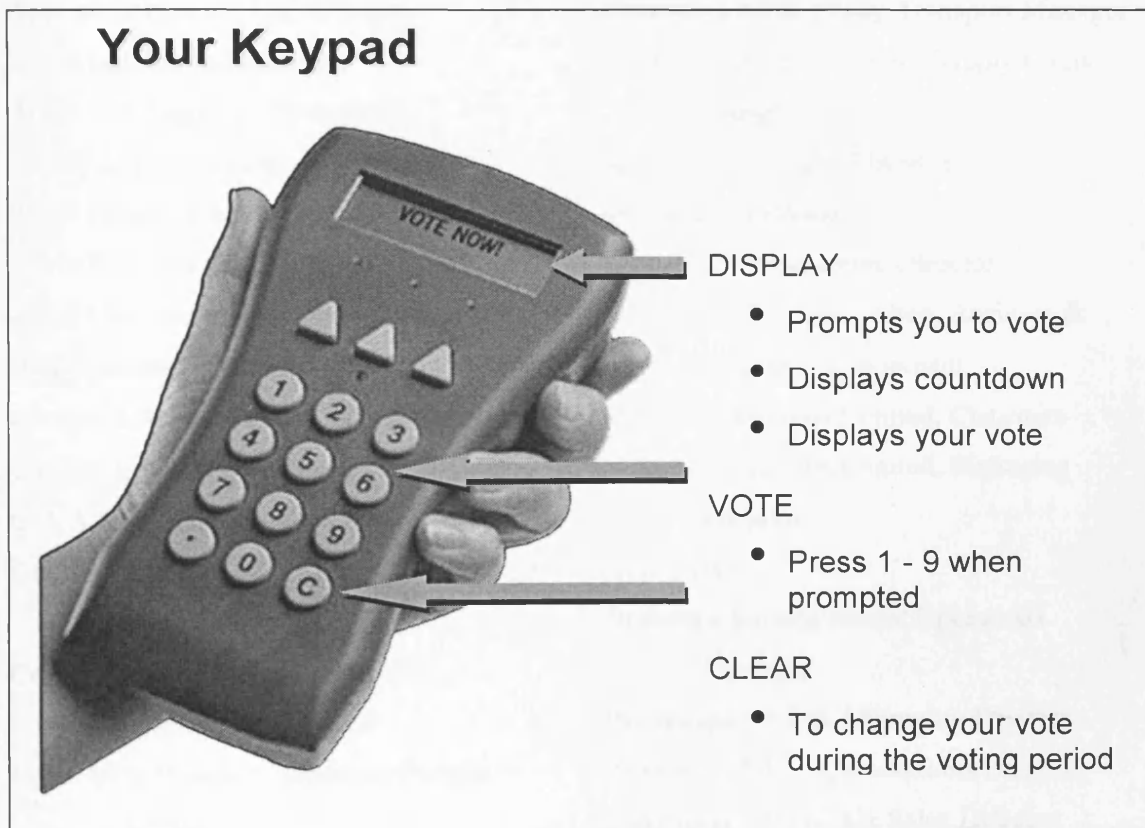
Appendix 1

Details of the dates, venues, and data collection methods deployed for the preliminary inductive study presented in Chapter 4

Company	Company Description	Date(s)	Venue(s)	Data Collection Method(s)
Company A	Major UK Based Grocery Retailer	Various 2002-08	Company Head Office	Semi-structured Interview/ Discussions
Company B	Major US Based Grocery Retailer (UK)	Spring 2005	Company Head Office	Semi-structured Interviews
Company C	Soft Drinks Manufacturer - UK	2003-04	Bradford	Semi-Structured Interviews
Company D	Multi-National Branded Goods Manufacturer	Jan 2004	Guildford	Telephone Interview
Company E	Multi-National Branded Goods Manufacturer	May & June 2006	Company Head Offices	Site Visit / Interviews and Discussions
Company F	Major European Based Grocery Manufacturer	Jan 2004	Slough	Telephone Interview
Company H	Leading European Based Logistics Service Provider	March 2006	Cardiff	Presentation and Semi-structured Interview
Company I	Leading UK Based Logistics Provider	Jan 2008	UK	Telephone Interviews
Company J	Leading Logistics Services Company	Jan 2008	Nr. Leicester	Semi-Structured Interview
Company K	Multi-National Branded Grocery Manufacturer	Feb 2004	London	Semi-Structured Interview
Company M	Leading UK Based Logistics Provider	Various 2004-07	Nr. Wolverhampton	Semi-Structured Interviews
Company N	Multi-National Logistics Provider	Jan 2007	UK	Telephone Interview
Company O	Major Steel Producer	Various 2005-08	Across UK	Site Visits / Semi-Structured Interviews
Company P	Multi-National Steel Products Manufacturer	March 2005	Scunthorpe	Site Visit & Semi-Structured Interview
Company R	Hot and Cold Rolling Mill	Feb/Mar 2005	Rotherham	Site Visit / Semi – Structured Interviews
Company T	Steel Product Supplier	Various 2004-08	South Wales	Site Visits / Semi-Structured Interviews

Appendix 2

An illustration and description of the interactive key pads given to all delegates attending the Transport in Supply Chain Networks Conference in February 2008. These keypads were used to record the responses to set questions asked to support the validation case for generalisation of findings from the inductive study and the longitudinal case study.



Appendix 3

A list of names and organisations for delegate attendees at the Transport in Supply Chain Networks Conference, Belfry Hotel, February 27th 2008

Company and Position (Where Known)	
Acres & Acres Supply Chain Consulting, Director	Loughborough University, Lecturer MARS, Logistics Services Buyer
Apprise Consulting Ltd, Director	Mcarthur Group, Group Transport Manager
Argos Ltd, Inbound Manager	Mcarthur Group, Logistics Supply Chain Manger
Aricia Ltd, Logistics Consultant	Microlise Ltd, Sales Director
Aspray Logistics, Logistics Director	Ministry of Defence
Aston Business School, Lecturer	MISIRI Uk, Operations Director
Aston Business School, Research Fellow	Modular Telecoms Limited, Business & Product Development
Aston University, Lecturer	Modular Telecoms Limited, Chairman
BAE Systems, Logistics Strategy Manager	Modular Telecoms Limited, Managing Director
Catalyst Logistics, Consultant Developer	Nestle Uk
Catalyst Logistics, Managing Director	Ordnance Survey, Senior Operations Manager
CEVA Logistics Limited, Managing Director	Palletways Uk Ltd, Managing Director
CILT (UK), Head of Information Forums & Influence	Palletways Uk Ltd, Operations Director
Corus Construction and Industrial, Development Manger	Palletways Uk Ltd, Uk Sales Director
Corus Strip Products, Manager Freight Operations	Price Guy Cholerton Ltd, Senior Consultant
Corus Strip Products, Railhead and Warehouse Manager	Road Haulage Association Ltd, Area Manager
Corus Strip Products, Supply Chain Graduate Trainee	Road Haulage Association Ltd, Regional Director
Corus UK Ltd, Director - Supply Chain	Ryder, Contract Manager
Corus, Distribution Manager	Samworth Brothers Distribution, Managing Director
Cranfield Centre for Logistics and SCM, PhD Student	SAPA Profiles UK, Logistics Manager
Crimson & Co, Director	SCALA Consulting Ltd, Senior Supply Chain Consultant
DAF Trucks, Product Marketing Manager	
DK Lind & Co, Partner	

East Midlands Regional Assembly, Head of Regional	Scala Consulting, Senior Consultant
Faber Maunsell, Senior Consultant	Scala Consulting, Senior Partner
Freight Best Practice, Freight Consultant	SGAG Associates Ltd, Managing Director
Freight Best Practice, Programme Director	Swansea Institute, Head of Supply Chain Centre
Freight Transport Association, Head of Policy	Swansea Institute, Lecturer
FTA	TDG plc, Strategy & Marketing Director
FTA, Transport Consultant	Tetley GB Limited, Logistics and Services Manager
Gist Uk Ltd, Network Planning Centre Manager	The Chartered Institute of Logistics and Transport (UK), Publisher/Editor
GKN Freight Services, Global Operations Director	Tianjin University (Cranfield University), Associate Professor
GKN Freight Services, Managing Director	Transport Planning Solutions Ltd, Director
Griffith Laboratories, Site Manager	University of Huddersfield, Course Leader
Home Retail Group, Transport Manager	University of Huddersfield, Research Fellow
Huf UK Ltd, Supply Chain Manager	University of Huddersfield, Research Student
Hull University, RCUK Academic Fellow in Logistics	WAG, Senior Business Development
Innovative Consulting Ltd, Director	Wincanton plc, Network Development Manager
KFI plc, Group Indirect Commodity Manager	Wincanton, Contract Manager
Kuehne & Nagel Ltd, Managing Director	Wincanton, National Transport Manager
Leicester Business School, Lecturer	Wincanton, Network Development Manager

Appendix 4

A list of questions and alternative responses posed at the Transport in Supply Chain Networks Conference – February 2008 to provide some validation of the findings from the exploratory inductive study (1st morning session – February 27th 2008)

1. In your experience of logistics provision in the last few years do you feel that the type of relationship which exists between the logistics provider and the shipper is aligned to the overall supply chain strategy?

Possible Alternative Responses: Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree

2. In your experience of logistics provision in the last few years do you feel logistics service providers have shown more / less interest in exploring initiatives which involve horizontal collaboration?

Possible Alternative Responses: Substantially More Interest, More Interest, No Change, Less Interest, Substantially Less Interest

3. In your experience of logistics provision in the last few years do you feel shippers have shown more / less interest in exploring initiatives which involve horizontal collaboration in logistics provision?

Possible Alternative Responses: Substantially More Interest, More Interest, No Change, Less Interest, Substantially Less Interest

4. In your experience of logistics provision in the last few years how would you compare the strength of the relationship the shipper has with its logistics provider compared to the product buyer – seller relationship?

Possible Alternative Responses: Significantly Stronger, Stronger, The Same, Weaker, Significantly Weaker

Appendix 5

A list of questions and alternative responses posed at the Transport in Supply Chain Networks Conference – February 2008 to provide some generalisation validation of the findings for the longitudinal case study relating to the Logistics Triad (2nd morning session – February 27th 2008)

1. In your experience of logistics provision in the last few years how often do the product supplier, the product customer and the lead logistics provider (the logistics triad members) formally aim to align objectives and working practices?
2. Is the non-contractually based relationship in the logistics triad a potential weak link in the chain of supply? (The non-contractually based relationship was shown on a diagram of the triad as the inter-link between the LSP and the Consignee)
3. Do you personally feel that the non-contractually based relationship in the logistics triad is a strategically important link in the chain of supply to warrant a renewed management focus?
4. Do you personally feel that the logistics triad concept is feasible and scalable across the supply chains you are familiar with?
5. In logistics provision which business – business interface do you feel is the most problematic link of the logistics triad?
6. Do you feel that the logistics triad alignment focus is a legitimate supply chain strategy, which should be addressed by members of logistics triads?

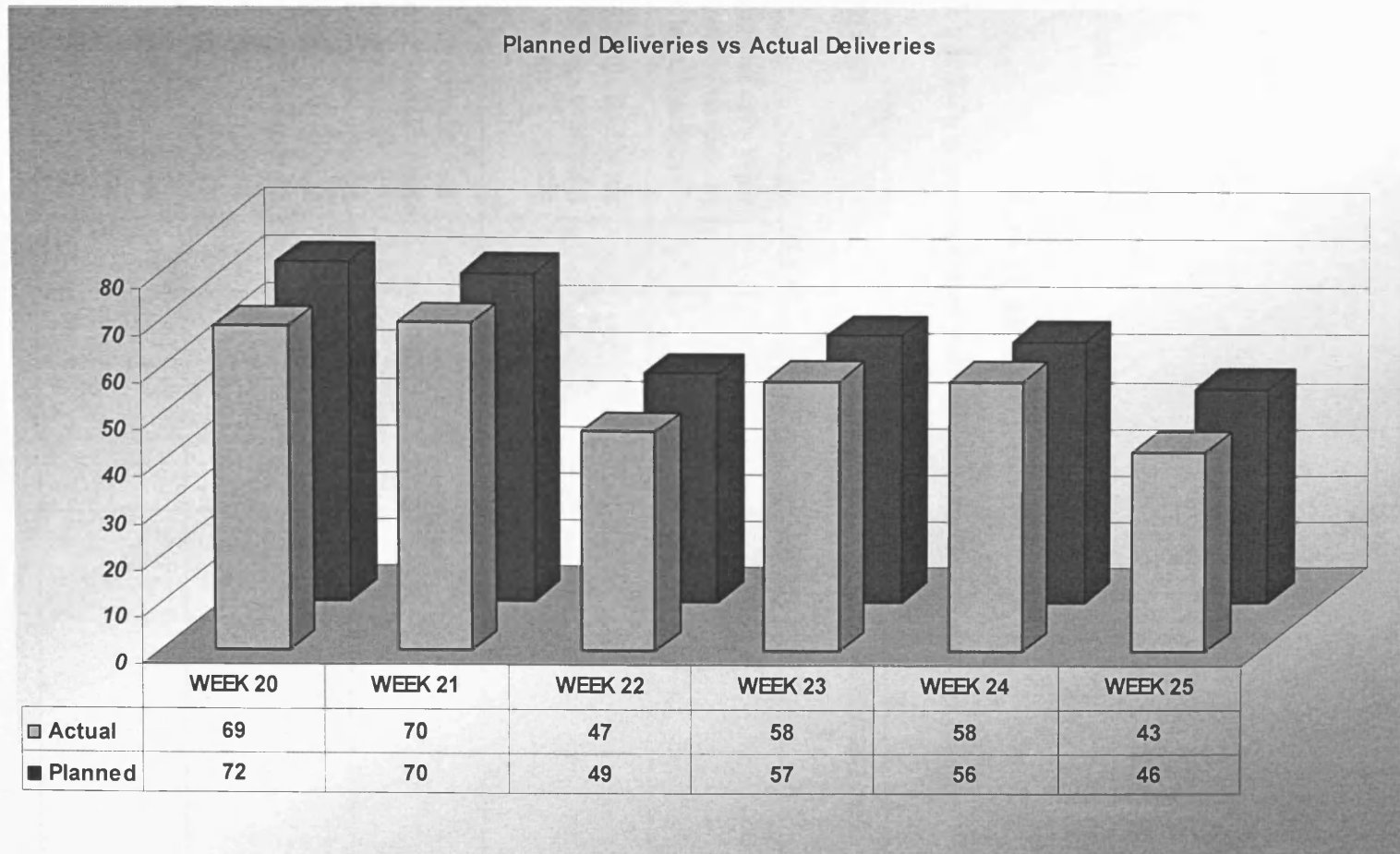
Appendix 6

A sample summary of the new measurement system which was introduced in the triad case study which was compiled by the LSP and communicated to all three parties -

Date	Delivery Performance					
	Planned Deliveries	Actual Deliveries (incl. unplanned emergencies)	% Delivered	Actual to Plan (Excludes emergency non-planned)	Performance to Original Plan	Ave. Tip Time
WEEK 20	72	69	96%	68	94%	00:34
WEEK 21	70	70	100%	68	97%	00:32
WEEK 22	49	47	96%	47	96%	00:18
WEEK 23	57	58	102%	57	100%	00:29
WEEK 24	56	58	104%	56	100%	00:25
WEEK 25	46	43	93%	41	89%	00:22
TOTALS	350	345	99%	337	96%	00:26

Appendix 7

An illustration of the visual graphs which were produced by the LSP and passed around all members of the logistics triad



Appendix 8

A list of questions used during the longitudinal case study to assess the state of inter-relationship between the three members of the logistics triad at the outset of the trial and after 24 months

Questionnaire

Date:

Name of Respondent:

Position:

Area of Responsibility:

Level of Partnering

(For each question please indicate your response on the 1-5 scale as follows:
1 = Low, 5 = High)

Question	Response					Comments (if any)
	1 (Low)	2	3	4	5 (High)	
1. What proportion of your customers do you consider to be medium/long term partners?						
2. To what extent do your partners have common visibility of supply chain processes?						
3. How well developed are your IT systems in supporting joint process management?						
4. Is there a common alignment of supply chain performance measures within your company?						
5. To what extent is there cross-integration of expertise within your company?						

Level of Partnering – with Company X

(For each question please indicate your response on the 1-5 scale as follows: 1 = Low, 5 = High)

Question	Response					Comments (if any)
	1 (Low)	2	3	4	5 (High)	
1. To what extent is the relationship with Company X adversarial (low) or managed through partnering (high)?						
2. To what extent does Company X have common visibility of supply chain processes?						
3. Is there a common alignment of supply chain performance measures between yourselves and Company X?						
4. To what extent is there cross-integration of expertise between yourselves and Company X?						
6. To what extent does trust exist between yourselves and Company X?						

Level of Partnering – Company Y

(For each question please indicate your response on the 1-5 scale as follows: 1 = Low, 5 = High)

Question	Response					Comments (if any)
	1 (Low)	2	3	4	5 (High)	
1. To what extent is the relationship with Company Y adversarial (low) or managed through partnering (high)?						
2. To what extent does Company Y have common visibility of supply chain processes?						
3. Is there a common alignment of supply chain performance measures between yourselves and Company Y?						
4. To what extent is there cross-integration of expertise between yourselves and Company Y?						
5. To what extent does trust exist between yourselves and Company Y?						

