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Hong Qiao

Collaboration in Demand Chain:
A Systematic Review
from a Communication Perspective

School of Management

MRes Dissertation

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Hong Qiao

Collaboration in Demand Chain:
A Systematic Review
From a Communication Perspective

Supervisor: Dr. Richard Wilding

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This thesis is submitted in partial fulfilment of the requirements
for the Degree of Master of Research in Management Research

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ABSTRACT

Collaboration is imperative in the demand chain in order to be able to share the seamless transparent information which is one of the key principals of demand chain organisations (Lee and Whang, 2001). It has been a key enabler widely accepted in demand chain literature, but most of the authors do not scientifically justify it. Since demand chain management is an emerging field of interest for academics, how collaboration works in this particular environment understandably remains under-researched. Most research on collaboration between buyer and supplier is not explicitly conducted in the competitive environment.

This thesis, using the methodology of systematic review, investigates the literature of demand chain management and collaboration from a communication perspective. The review of studies on collaboration between buyer and supplier is expected to provide insight for the study on collaboration in demand chain environment. There are 21 works included for the demand chain literature review and 25 for collaboration from a communication perspective.

This systematic review of literature on demand chain management and collaboration from a communication perspective identifies seven enablers for demand chain system, among which collaboration and technology-enabled communication are two key enablers together with agility etc. This review also identifies two main themes in collaboration with communication perspective literature: communication in collaboration with buyer-supplier relationships as a communication media, and communication in collaboration with buy-supplier relationships as a social process. A holistic view of communication behaviour within buyer-supplier relationships is recommended and future work in this field is needed.

DEDICATION

To my family

ACKNOWLEDGEMENTS

I could not have researched and written this thesis without the assistance of many people.

I would like to thank my supervisor Dr. Richard Wilding for his support, encouragement and trust throughout the course of this work; the panel, Dr. David Denyer and Dr. John Towriss, for their constructive and creative comments during the review.

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Chapter 1 Introduction

1.1 Overview

According to Krapfel (Krapfel et al., 1989), there are six strategic relationship management modes: collaboration, negotiation, administration, domination, accommodation and submission. Krapfel et al. (1989) describes collaboration as “a highly co-operative mode distinguished by very open, trusting communication and a high density of information sharing.” It has been discussed both theoretically and empirically in Wood and Gray’s work in 1992. (Wood and Gray, 1991).

Collaboration in the monopoly business environment has been studied by Humphries (Humphries and Wilding, 2004), in which they argue that relationship communication leads to a self-reinforcing relationship success cycle. This relationship communication is characterised as frequent, open dialogue and information sharing which is recognised as an important generic relationship success factor within monopoly market (Humphries and Wilding, 2004). On the other hand, information impactedness characterised as deliberately confusing to gain advantage over partners sits in the business relationship failure cycle. Since communication is not the focus of previous research, the mechanism for turning information impactedness into relationship communication is unclear. Thus the business relationship failure and success cycles remain separate.

The phenomenon of collaboration has been discussed in a wide context. Under increasing pressure from demand variability and time-based competition, it is becoming crucial to win business in this demand-driven economy. But most of the literature on collaboration does not distinguish them as being in a demand-driven context.

This systematic review of literature intends to understand collaborative business relationships within the demand chain environment by reviewing the literature of collaboration from a communication perspective. In particular, it intends to study the role of communication in facilitating collaborative business relationships in a buyer-supplier relationship context. In the relationship development framework proposed by Dwyer (1987), this review

only looks at the communication processes at the stages of relationship expansion and commitment.

The theoretical implication of this focus is to discover the linking mechanism between the spiral of success and spiral of failure (Wilding and Humphries, 2002) through communication in a competitive environment. The spiral of success is a sequence of organisation behaviours which leads to successful business relationships and the spiral of failure is a sequence of organisation behaviour that leads to problematic business relationships. The practical implication is to help firms in the spiral of failure turn the relationship into success and help firms in the spiral of success maintain value-added collaborative relationships with business partners and customers.

1.2 Review Rationale

This systematic review is intended to study the collaboration in demand chain environment from a communication perspective. Effectively there are two fields to be reviewed: one is the field of demand chain management and the other is the field of collaboration from a communication perspective.

The first field for review is demand chain management. Demand chain management is rapidly becoming the next major frontier for effective competition (Vollmann et al., 1995). The philosophy of demand chain management that is customer-centred management (Langabeer et al., 2001) has been practised in industry for a while. But as an academic field, the demand chain is rather novel and lacks a conceptual foundation (Jüttner et al., 2004). Most contributions to demand chain management have been based on best practice examples (Jüttner et al., 2004). As an emerging field of study, there is neither consensus on terms and theories, nor an integrated literature review in demand chain management. Therefore, information about the current state of research is needed. A systematic review of the demand chain literature will provide a platform for future discussion and theory building.

From scoping study, the demand chain management discussion is informed by marketing, supply chain and network literature (See Figure 1-1).

The working definition of demand chain management that has been adopted for this systematic review is “managing customer value through responsive networks”. This definition is still under discussion within the demand chain management community in Cranfield.

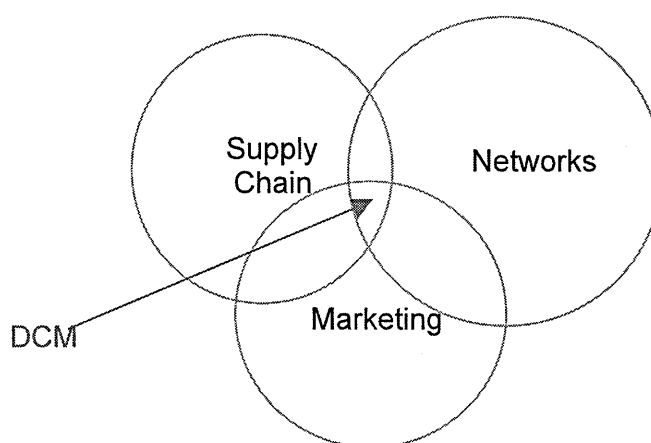


Figure 1-1: Mapping the Field of Demand Chain Management

The second field for the review is collaboration from a communication perspective.

Collaboration is imperative in the demand chain in order to be able to share the seamless transparent information which is one of the key principals of demand chain organisations (Lee and Whang, 2001). It has been a key enabler widely accepted in demand chain literature. But most of the authors do not scientifically justify it. Since demand chain management is an emerging field of interest for academics, how collaboration works in this particular environment understandably remains under-researched. Most researches on collaboration between buyer and supplier are not explicitly conducted in the competitive environment. The review of studies on collaboration between buyer and supplier will provide an insight for the study on collaboration in the demand chain environment.

A communication strategy treating communication as a social process is needed for a really successful collaborative relationship. From communication perspective, information technology is the communication media and it is an enabler for seamless transparent information sharing, which is sufficient but not necessary for high quality relationships. Firms

cannot take it for granted that investment on electronic linkage with partners will definitely improve the relationship quality. Indeed, it may lead to a worse situation since more sunk costs involved in the relationship.

Besides the information shared by electronic linkages, collaboration is also an interactive process involving boundary spanning activities. Boundary persons transfer information between organisations (Tushman and Nadler, 1978). The mismatched value or mis-interpreted value leads to conflicts within relationship, eventually leads to deficiency and relationship disillusion. Effective communication enhances firms' trust and commitment to the relationship (Matcalf, Frear and Krishnan, 1992).

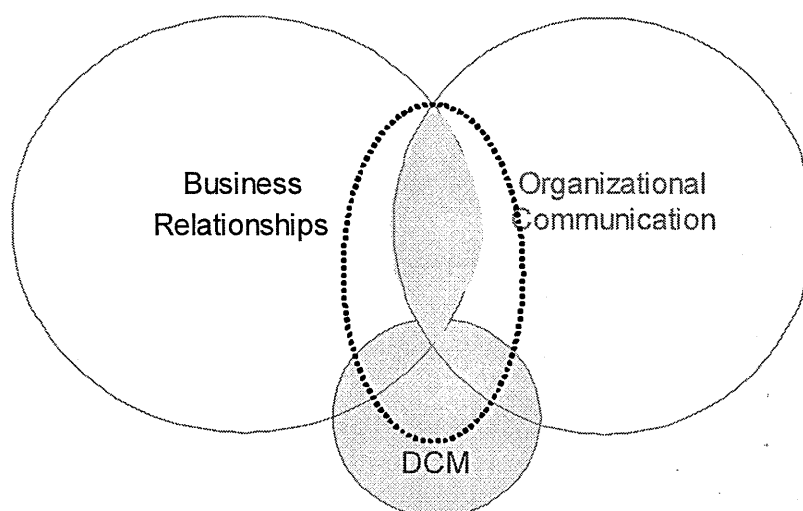


Figure 1-2: Mapping the Field for This Review

Both collaboration and communication are rich phenomena, which would require an enormous amount of time to separately conduct reviews on them both. It is much more manageable, and sensible, to conduct the review on literature that studies how communication has an impact on collaboration. This is where the second field for review comes from.

It is neither wise nor possible to draw clear boundaries for these two fields for the review. There are some works not sitting in the boundaries, but still providing insights to the understanding. Hence, although the actual area for the review comprises the field of demand chain management and the field of collaboration from communication perspectives, the actual works to be included in the review may well be anywhere within the area enclosed by the dotted line in Figure 1-2.

1.3 Review Objectives

This research attempts to study the collaboration in demand chain environment from a communication perspective. Since there is insufficient literature on collaboration in the field of demand chain management to generate valid propositions, but there is a large body of literature on collaboration and communication, this work will systematically review the literatures on demand chain management and on collaboration from a communication perspective. The latter is expected to provide insights for collaboration in demand chain management. Hence the primary aim of this review is:

- *To undertake a systematic review of the literature on demand chain and collaboration from a communication perspective.*

The link between demand chain management and collaboration remains unclear until a systematic review of literature on demand chain management is undertaken. The interactive relationship between collaboration and communication in buyer-supplier business relationships needs to be investigated in order to further understand how those relationships work within the demand chain environment. Therefore, there are two objectives to achieve for this systematic review:

- *To evaluate whether and to what extent collaboration is a key enabler of demand chain management;*
- *To investigate the organisational communication processes that facilitate collaboration.*

In the following chapters, the review activities are constantly aligned with the review aim and objectives. In Chapter 2, the systematic review methodology is introduced. The key search strings and selection criteria that are the most important aspects of the methodology are justified. In Chapter 3, the descriptive analyses of included works are presented. These descriptive analyses of included works on demand chain management and collaboration from communication perspective provide statistical and demographic characteristics of the included literature.

The thematic findings follow. In Chapter 4, the thematic findings of demand chain management literature are presented. The demand chain definitions are discussed firstly in order to level audience understanding of current divergent views on demand chain management. Then, by breaking down the discussion of each of the included works, seven demand chain enablers are identified and the benefits of having demand chain system in place are outlined. At the end of this chapter, a demand chain conceptual framework is proposed. Worth mentioning is that collaboration and technology-enabled communication are two enablers among the seven. By then, the first review objective has been met.

In Chapter 5, a different synthesis approach to literature is adopted. In the previous chapter, literature is synthesised using grounded theory approach, i. e. a quantitative, theory building approach. This approach works well with the fragmented demand chain literature. The literature on collaboration from a communication perspective has different characteristics because the amount of both collaboration and communication literature on which a rigorous quality assessment can be applied is large and well established. Therefore, this part of literature is synthesised based on an adapted theoretical framework (See Figure 5-1).

There are two themes in this literature: communication as media and communication as a social process. In the first theme, the works mainly focus on the communication media. The inexplicit assumption is that communication technology is very important and can explain most communication phenomena. Communication technology has a positive relationship with collaboration. In the second theme, the works make the assumption that communication is a social process. There are much richer content of communication than the technology. The impact of communication on collaboration is complex and contingent. Discussions follow to close this chapter.

Conclusions are presented in Chapter 6: critiques of the review, thoughts about the methodology, and recommendations for future research are addressed in this chapter. After this chapter, references and appendices are attached.

Chapter 2 Methodology

2.1 Evidence-based Policy and Practice

The initiative of Evidence-based Policy and Practice (EBPP) was launched by ESRC in 1999. As a response to concerns about time lag and distance between social science research and decision making process in practice, EBPP centres work on the exchange of research-based evidence between researchers and practitioners, and develop methods of appraising and summarising the results of research relevant to policy and practice. Systematic review, as relative to traditional narrative review¹, has been developed over the last decade and now plays a major role in evidence-based practices (Tranfield, et al., 2003).

Systematic review is “a review of the evidence on a clearly formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant primary research, and to extract and analyse data from studies that are included in the review. Statistical methods (meta-analysis) may or may not be used” (NHS Centre for Reviews and Dissemination, 2001). As a methodology to synthesise literature, it adopts a replicable, scientific and transparent process aiming to minimise bias through exhaustive literature searches and to provide an audit trail of the reviewers’ decisions, procedures and conclusions (Cook, et al., 1997). It is predominantly applied in medical science and healthcare. It has also been applied to other social sciences such as education and social policy etc. In the field of management, Tranfield et al. (2003) argue that systematic review lies at the heart of a “pragmatic” management research, which aims to serve both academic and practitioner communities.

2.2 Cranfield Systematic Review Process

Adapted from the NHS review process, the Cranfield systematic review process is designed to conduct a systematic review in management science.

¹ Narrative (or traditional) review: A summary of the main points and trends in the research literature on a specific topic. (Source: MRes03 course binder, Cranfield School of Management)

The generic process is illustrated in Table 2-1. This process is used by Cranfield MRes students for their systematic reviews, and I have used it to conduct the systematic review of the literature on collaboration in demand chain environment from a communication perspective, which is reported in this work.

Table 2-1: Generic Cranfield SR Process

STAGE 1: PLANNING THE REVIEW
Step 1: Forming a review panel
Step 2: Mapping your field of study
Step 3: Producing a review protocol
STAGE 2: IDENTIFYING AND EVALUATING STUDIES
Step 4: Conducting a systematic search (See Appendix A)
Step 5: Evaluating studies (See Appendix B)
STAGE 3: EXTRACTING AND SYNTHESISING DATA
Step 6: Conducting data extraction (See Appendix C)
Step 7: Conducting data synthesis
STAGE 4: REPORTING
Step 8: Reporting the findings
STAGE 5: UTILISING THE FINDINGS
Step 9: Informing research
Step 10: Informing practice

Source: MRes03 Course Binder

The planning stage of this systematic review ended when the review protocol was produced for the MRes review. The revised protocol incorporated the panel’s comments and the changes are justified in the next section. This piece of work is an effort to report the findings after conducting a systematic search, evaluating studies, conducting data extractions and performing data synthesis. This report will form basis of the literature review for PhD research. In this sense, this systematic review informs research.

2.3 Justification of Protocol Alterations

There are 10 steps within 5 stages for the systematic review of evidence activities (See Table 2-1). The unchanged parts of the protocol are attached in

appendices A-C. The altered parts of the review protocol are to be justified in the following sections. There are four major changes to the protocol:

- Keyword search strings: this change was made after the panel's recommendation;
- Electronic databases: this change reflects the practicality of conducting the search;
- The selection of studies: this particularly refers to the exclusion criteria and was refined to incorporate the panel's comments;
- The study quality assessment criteria: this was also refined to incorporate the panel's comments.

2.3.1 Keyword Search Strings

The initial keyword search strings were a list of keywords identified through scoping study. This list contains search strings covering demand chain, collaboration and communication. But it is hard to justify the completeness of this list. By using RefViz™, the list of keywords for the search is much more complete.

RefViz™ is a text analysis and visualisation software application designed to analyse, organise, and facilitate comprehension of the large amounts of literature available to researchers today. Documents are organised by thematic content and presented in interactive visualisations that facilitate rapid identification of major themes and areas of interest. By offering expanded literature searches, RefViz™ minimises the loss of important information that may occur by narrowing the original search prematurely.

A high level search in ISI Web of Science was undertaken by using the general terms of “supply chain AND collaboration”, “supply chain AND relationship”, “buyer-supplier AND relationship”, “supply chain AND communication” and “supply chain AND customer responsive*”. Then all the citations were input into RefViz™. The software identifies all the words used in the citations. The ones needed were chosen for the review and were combined them into search strings. Most keywords for this review are identified by using RefViz™. This method is particularly useful for identifying search strings relating to supply chain literature. Another source of keywords is scoping study. This source helps to identify demand chain related keywords.

The final list of keyword search strings has six strings as shown in Table 2-2. The actual search strings are the combination of strings in each column with the strings in each row. There is some repetition as shown in the table. So there are total of 5 search strings conducted for the actual search.

Hence, the actual keyword search strings used in the search are:

1. demand chain
2. (supply chain OR buyer-supplier OR supplier-buyer OR supply network OR supply web) AND (demand-driven OR customer-driven OR customer-focused OR demand-based)
3. (supply chain OR buyer-supplier OR supplier-buyer OR supply network OR supply web) AND (customer respons* OR demand respons* OR agil* OR customi*)
4. (supply chain OR buyer-supplier OR supplier-buyer OR supply network OR supply web) AND (communica* OR edi OR cpfr OR information OR electronic OR technology OR internet OR software OR e-business OR web-based OR internet-based OR e-commerce OR erp)
5. (supply chain OR buyer-supplier OR supplier-buyer OR supply network OR supply web) AND (collabor* OR partner* OR coordinat* OR alliance OR cooperat*)

2.3.2 Data Sources

The proposed sources for the review include free online journals, EBSCO, ProQuest and SCKC library database. Since this review has been done within a limited time scale, only published papers in scholarly journals are included, rather than all the possible sources. Books, conference papers and unpublished papers included in the review are either cross-referenced or recommended by experts. Free online journals are not included in the actual search because they are purely practitioner-oriented articles. The proposed free online journals to be included in the review are attached in the Appendix A A.

Table 2-2: Matrix of Keyword Search Strings

		supply chain OR buyer- supplier OR supplier- buyer OR supply network OR supply web	demand- driven OR customer- driven OR customer- focused OR demand- based	customer respons* OR demand respons* OR agil* OR customi*	communica* OR edi OR cpfr OR information OR electronic OR technology OR internet OR software OR e-business OR web-based OR internet-based OR e- commerce OR erp	collabor* OR partner* OR coordinat* OR alliance OR cooperat*
demand chain	Search String 1	--	--	--	--	--
supply chain OR buyer-supplier OR supplier-buyer OR supply network OR supply web	--	--	Search String 2	Search String 3	Search String 4	Search String 5
demand-driven OR customer-driven OR customer-focused OR demand-based	--	Search String 2	--	--	--	--
customer respons* OR demand respons* OR agil* OR customi*	--	Search String 3	--	--	--	--
communica* OR edi OR cpfr OR information OR electronic OR technology OR internet OR software OR e- business OR web- based OR internet- based OR e- commerce OR erp	--	Search String 4	--	--	--	--
collabor* OR partner* OR coordinat* OR alliance OR cooperat*	--	Search String 5	--	--	--	--

After investigation of journals in the SCKC library database, there was found to be a great overlap with journals in major electronic databases

available through the King's Norton library at Cranfield. The journal source databases in SCKC library database are EBSCO, Emerald, Factiva, SwetsWise, Proquest, Ingenta and Science Direct. As shown in Table 2-3, most journals in Emerald, Factiva, SwetsWise and Ingenta are also collected by ISI Web of Science. The only difference is the full text availability. It is easy to obtain the abstract of relevant papers from ISI Web of Science and then manually search for the actual papers in these databases. There are two journals that are not collected in ISI Web of Science: Cranes Today and Management Today. From the journal description in Factiva, the former publishes news and technical articles for the international crane industry; the latter publishes non-academic management decision-making articles. Both published non-academic articles, therefore neither falls into the review scope. At this stage, the electronic databases for the search are: EBSCO, ProQuest, ScienceDirect and ISI Web of Science. A comparison between SCKC and ISI is given in Table 2-3.

Table 2-3: Journals in SCKC Library Database & in ISI

JOURNAL	SCKC	ISI
Int'l Jrnal of Physical Dist'n & Logistics Mngt	Emerald	Yes
Logistics Information Management		
Cranes Today	Factiva	No
Journal of Supply Chain Management		Yes
Management Today		No
Material Handling Engineering (Mngt)		Yes
Int'l Jrnal of Operation & Production Mngt	SwetsWise	Yes
Logistics Information Management		
Supply Chain Management	Ingenta	

A pilot search was conducted by using a string of "demand chain" in above-mentioned four databases and the results are given in Table 2-4. It has been shown that each database contributes new, relevant articles to demand chain literature. Hence the final databases for conducting the search are: ProQuest, EBSCO, Web of Science and Science Direct.

Table 2-4: Database Assessment

	SEARCH FOR	IN	COLLECTIONS	TIME FRAME	NO. OF ENTRY	NO. OF RELE- VANT	NEW ARTI- CLE
ABI (Pro Quest)	demand chain	Abstract	Abi global, Trade & Industry and Applied science	From 1980	17	16	16
EBSCO Business Source Premier	demand chain	Default folders	N/A	From 1980	21	20	12
Web of Science (ISI)	demand chain	Title only	Social science citation	From 1980	17	17	2
Science Direct	demand chain	Title and abstract	Business, Management & Accounting. Civil Engineering. Decision Sciences. Economics & Finance. Psychology. Social Science	From 1980	11	11	2

2.3.3 The Inclusion and Exclusion Criteria

The selection of studies is Step 5, as proposed by Cranfield Systematic Review Process (See Table 2-1). It includes comparing each paper against inclusion and exclusion criteria, and the analytical quality assessment of the included papers. This section addresses the first part of the study selection process.

The general inclusion criteria are:

- Works written in English after 1980: Key works in the area have been developed since the 1980s.
- Relevance: works discussing the following topics are regarded relevant.
 - Buyer-supplier relationship

-
- Collaboration, cooperation and coordination in supply chain context
 - Inter-functional collaboration
 - Integration between marketing and supply chain functions
 - Communication process in organisation or inter-function
 - Technology-enabled communication inter or intra firms
 - Customer responsive network
 - In Business-2-Business and Business-2-Consumer context
 - At organisational level: the level of analysis in this study is at functional level, therefore works at individual level are not considered.

The specific inclusion criteria for each type of paper:

- Theoretical papers must contain:
 - A conceptual or theoretical review of ideas about buyer-supplier relationship and organisational communication in the fields of demand chain, organisational communication and marketing;
 - Construction, consideration and discussion of a theory, model or conceptual framework to facilitate the better understanding of buyer-supplier relationship and organisational communication in general;
 - Construction, consideration and discussion of a theory, model or conceptual framework to specifically study collaborative buyer-supplier relationship;
 - Construction, consideration and discussion of a theory, model or conceptual framework to facilitate the better understanding of demand chain management.
- Empirical papers must contain:
 - Empirical studies of buyer-supplier relationship where communication plays a role;
 - The effectiveness of organisational communication strategy on buyer-supplier relationship in practice;
 - Demand chain management best practice;
 - Reviews of the above.
- Methodological papers must contain:

-
- Conceptual or empirical papers which consider the issues of how to measure the impact of organisational communication strategy on the buyer-supplier relationship;
 - Conceptual or empirical papers which address the factors that are significant in demand chain management.

The exclusion criteria are:

- Specific technological development in ICT industry: this report is not a review of particular technical development.
- Supply chain optimisation: this normally falls into operational side of supply chain management.
- Interpersonal communication unless it discusses its translation into socially embedded connectivity between functions or firms: this report is not concerned with interpersonal communication. It is concerned with inter-organisational communication, in particular with the communication behaviour between buyer and supplier, or consumer and supplier. Undoubtedly inter-organisational communication eventually culminates in interpersonal communication. However it is the translation from interpersonal to socially constructed relational communication between functions or firms that is of interest for this review.
- The impact of PR on buyer-supplier relationship: there is a body of literature about how PR impacts on buyer-supplier relationship, but its focus is on the impact of PR rather than the relationship.
- Detailed business process re-engineering account: its focus is on BPR rather than business relationships.
- Interface between operation and information systems: this is closer to information science rather than information technology functioning as a communication medium.
- Detailed performance measurement project: the focus is on PM rather than on how PM impacts on business relationships.
- Buyer-supplier negotiation process: this is not relevant.
- The impact of public policy on the supply chain: this is not relevant.
- Operational side of supply chain: again it is not relevant.

2.3.4 Study Quality Assessment Criteria

The papers that met inclusion and exclusion criteria are assessed in four dimensions: theory robustness, implication for practices, methodology and generalisability. At each dimension, there are three levels: low, medium and high. At the end, an overall rate is given for each paper. This quality assessment is adapted from Pittaway et al. (2004). The papers with an overall score of less than 2 are rejected for the review. Details of quality assessment are given in Appendix B.

2.4 The Review Strategy

Based on the generic Cranfield systematic review process, the review strategy for this particular work had several stages as outlined in Table 2-5. Also shown is the number of papers shortlisted at appropriate stages.

Table 2-5: Systematic Review Process for This Study

	STAGE	NO.
1	Mapping the field of collaboration in demand chain: a communication perspective	N/A
2	Producing a review protocol	N/A
3	Refining the search strings and studies selection criteria	N/A
4	Justifying the databases for the search	N/A
5	Reviewing 4 citation databases by using the refined 5 search strings	7246
6	Eliminating duplications and reviewing the title and abstract of the citations according to the inclusion and exclusion criteria	349
7	Reviewing the paper citations according to the inclusion and exclusion criteria	114
8	Assessing the quality of the shortlisted papers and selecting the qualified papers and importing their abstract from ProCite5 to Nvivo	46
9	Coding the included papers by using Nvivo. The sources of these papers are systematic search, cross-referencing, scoping study and expert recommendation.	46
10	Reporting (The included works and the works that support the arguments)	80

Chapter 3 Descriptive Findings

The discussion of findings from systematically reviewing the literature can be divided into two parts: the descriptive findings and the thematic findings according to the nature of the findings. The thematic findings are presented in Chapters 4 & 5. The descriptive findings are analysed in this Chapter.

The descriptive findings illustrate the main attributes of the demand chain literature and collaboration from a communication perspective literature. These “physical” attributes provide an overview of the fields and demonstrate the trends of research work done in these fields. Some statistics are deployed in this part in order to quantitatively sculpt the characteristics of the fields. This part comprises three sections: the overall characteristics of the included works, the descriptive findings of demand chain management, and the descriptive findings of collaboration from a communication perspective.

3.1 Overview of Characteristics

The initial entries generated from the searches conducted in June 2004 in four databases are enormous (See Table 3-1), and there are a large number of irrelevant papers and duplicates. At the end, 46 papers have gone through the rigorous systematic review process and met the quality assessment criteria, among which there were 21 papers for demand chain management and 25 papers for collaboration from communication perspective.

These 46 papers come from a diverse journal source (Table 3-2), which reflects the multidisciplinary nature of this widely discussed phenomenon. But overall supply chain journals, operation journals and logistics journals contribute much to the discussion.

Most of these 46 papers have been produced in the last six years (Figure 3-1), when industrial applications of information technology reduced the cost barrier and become more widely accepted in business operations. This significantly changed the way in which people interacted with each other and how firms organise their profit maximising activities. In particular, the intensifying usage of information technology in industry practice has raised the connectivity of collaborating firms and simultaneously raised the interest

of discussion. More detailed descriptive findings are to be discussed separately in the following sections of demand chain management and collaboration.

Table 3-1 Number of Entries in Each Database

	PROQUEST	EBSCO	WEB OF SCIENCE	SCIENCE DIRECT
demand chain	17	21	17	11
(supply chain OR buyer-supplier OR supplier-buyer OR supply network OR supply web) AND (demand-driven OR customer-driven OR customer-focused OR demand-based)	17	15	21	5
(supply chain OR buyer-supplier OR supplier-buyer OR supply network OR supply web) AND (customer respons* OR demand respons* OR agil* OR customi*)	116	140	118	14
(supply chain OR buyer-supplier OR supplier-buyer OR supply network OR supply web) AND (communica* OR edi OR cpfr OR information OR electronic OR technology OR internet OR software OR e-business OR web-based OR internet-based OR e-commerce OR erp)	1223	1822	975	405
(supply chain OR buyer-supplier OR supplier-buyer OR supply network OR supply web) AND (collabor* OR partner* OR coordinat* OR alliance OR cooperat*)	743	888	587	91

Table 3-2: Journal Source of Included Works

JOURNAL	NO.
Journal of Operations Management	11
International Journal of Physical Distribution & Logistics Management	4
Industrial Marketing Management	2
Journal of Supply Chain Management	2
Transportation Research Part E: Logistics and Transportation Review	2
EMAC	1
European Journal of Operational Research	1
Forest Products Journal	1
Information Systems Research	1
International Journal of Information Management	1
International Journal of Logistics Management	1
International Journal of Production Economics	1
Journal of Business Logistics	1
Journal of Marketing Management	1
Journal of Purchasing and Supply Management	1
Journal of the Operational Research Society	1
Logistics Manager	1
Long Range Planning	1
McKinsey Quarterly	1
Perspectives for Managers	1
Production & Inventory Management Journal	1
Production & Operation Management	1
Production Planning & Control	1
Purchasing Today	1
Supply Chain Management Review	1
Team Performance Management	1
Tourism Management	1
Transportation Journal	1

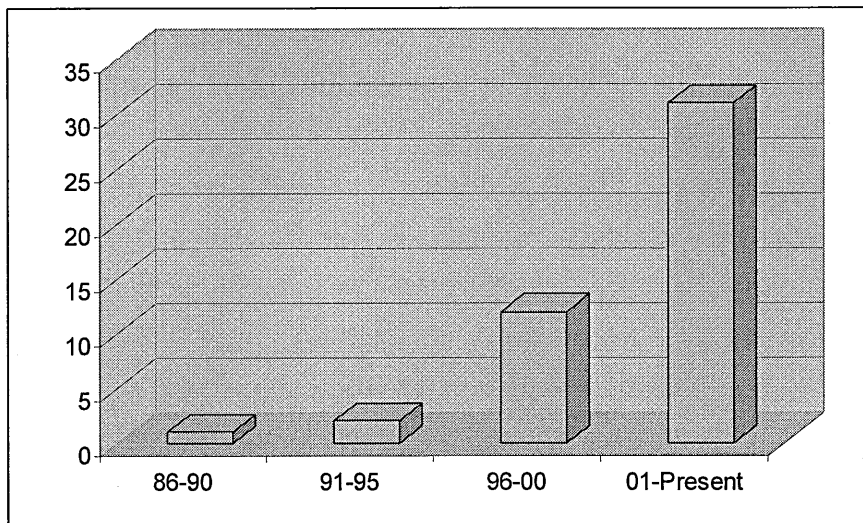


Figure 3-1: Works Produced in Each Period

3.2 Demand Chain Management

This systematic review includes 21 works on demand chain management but the literature is very fragmented. The 21 works also have different strengths in empirical data, methodology, and theory building. The descriptive statistics are produced based on these 21 works only and are valid till June 2004. However, although there are other very interesting works, they either do not pass quality assessment in the review or do not fit the review scope; therefore they have not been included in this review.

3.2.1 Included Works

There are 21 works included in this part of review (Table 3-3). The major keywords cited in these 21 works are tabulated in Table 3-4. The most frequently cited keywords are “supply chain” and “management”. The term “demand” appears in three places: “demand chain management”, “supply & demand” and “demand”. Most of these 21 papers are empirical ones (Figure 3-2) and in manufacturing (Figure 3-3), but this is not sufficient evidence to conclude that a demand chain management model is more applicable in manufacturing. However, Frohlich suggests that demand chain management

in retailers and grocery/food distribution companies deserves further investigation (Frohlich and Westbrook, 2002).

Table 3-3: List of Included Works

Brace and Gibbons (1989)
Childerhouse, Aitken, and Towill (2002)
de Treville, Shapiro, and Hameri (2004)
Ellinger (2000)
Frohlich and Westbrook (2002)
Heikkilä (2002)
Hines, Silvi, and Bartolini (2002)
Holmstrom, Louhiluoto, Vasara and Hoover (2000)
Jüttner, Baker and Christopher (2004)
Korhonen, Huttunen and Eloranta (1998)
Langabeer and Rose (2002)
Lee and Whang (2001)
Lummus and Vokurka (1999)
Murphee (1999)
SAP (2003)
Selen and Soliman (2002)
Van Landeghem and Vanmaele (2002)
Vollmann and Cordon (1998)
Vollmann, Cordon and Heikkilä (2000)
Vollmann, Cordon and Raabe (1995)
Williams, Maull and Ellis (2002)

Table 3-4: Major Keywords Cited in the Review

Supply chain	19	Demand chain management	6	Industrial procurement	3
Management	13	Supply & demand	4	Demand	2
Operations research	6	Logistics	4	Inventory control	2
Planning	6	Manufacturing process	3	Information systems	2

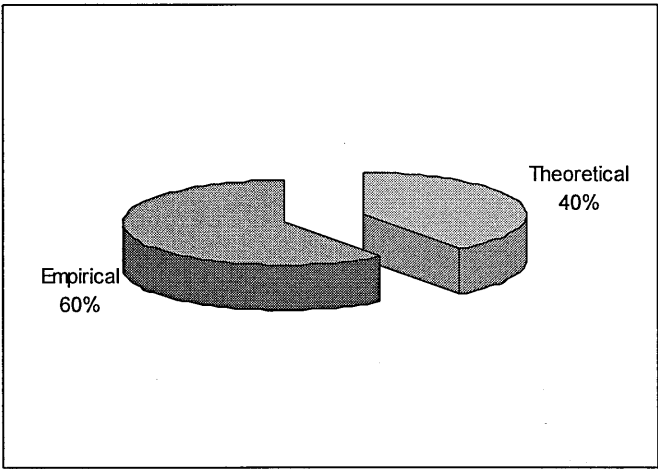


Figure 3-2: Type of Included Papers

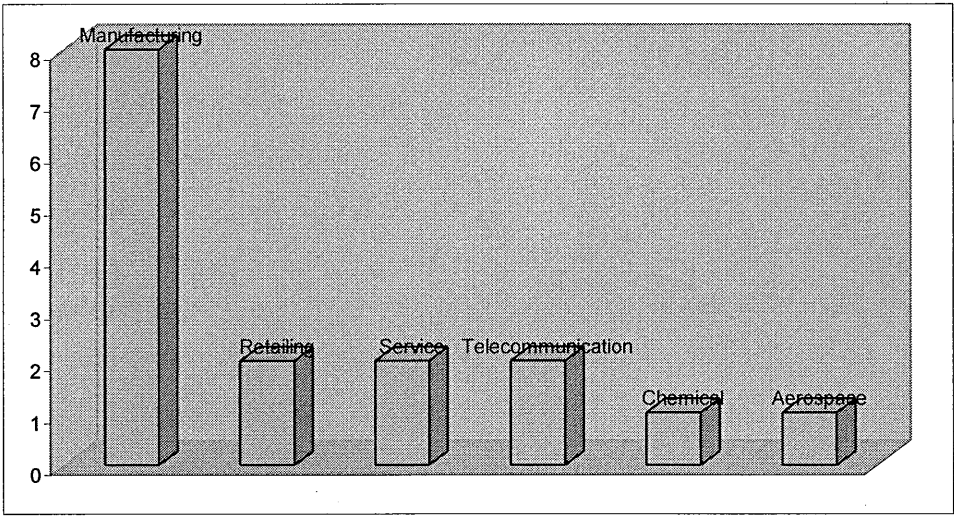


Figure 3-3: Industrial Context of Included Papers

3.2.2 Demography of Included Works

Most of these 21 works are produced after 2000. There is only one included work published in the late 80', which is the earliest appearance of the term "demand chain" in academic circles (Figure 3-4). UK and USA have the largest author groups in this area compared with other countries (Figure 3-5). However, in Switzerland and Finland, authors are mainly concentrated in one or two leading institutes. 55% works are published in journals in operations

(Figure 3-6). Managerial oriented publication is another major source of included works. These characteristics reflect the fact that demand chain management is an emerging business model.

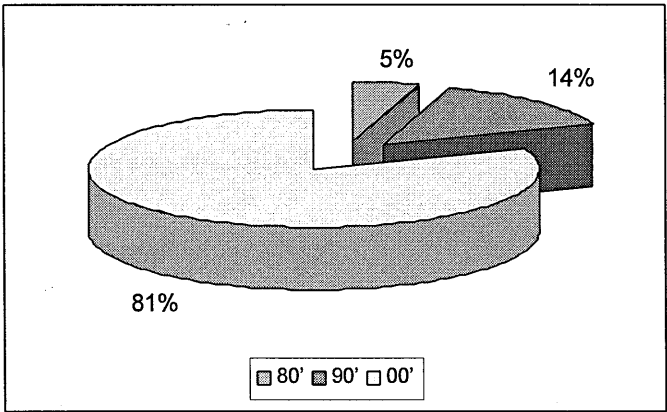


Figure 3-4: Included Works in Three Decades

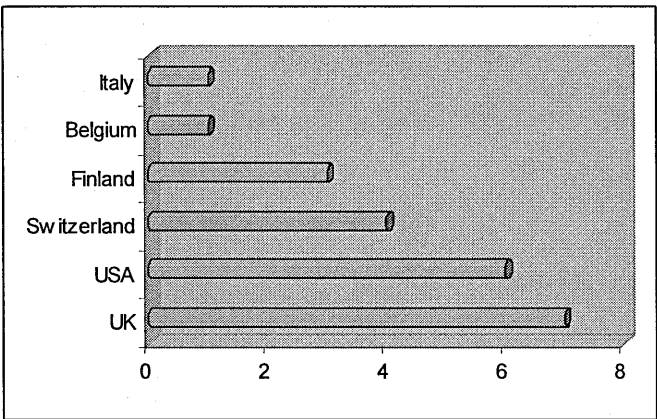


Figure 3-5: Location of Authors of Included Works

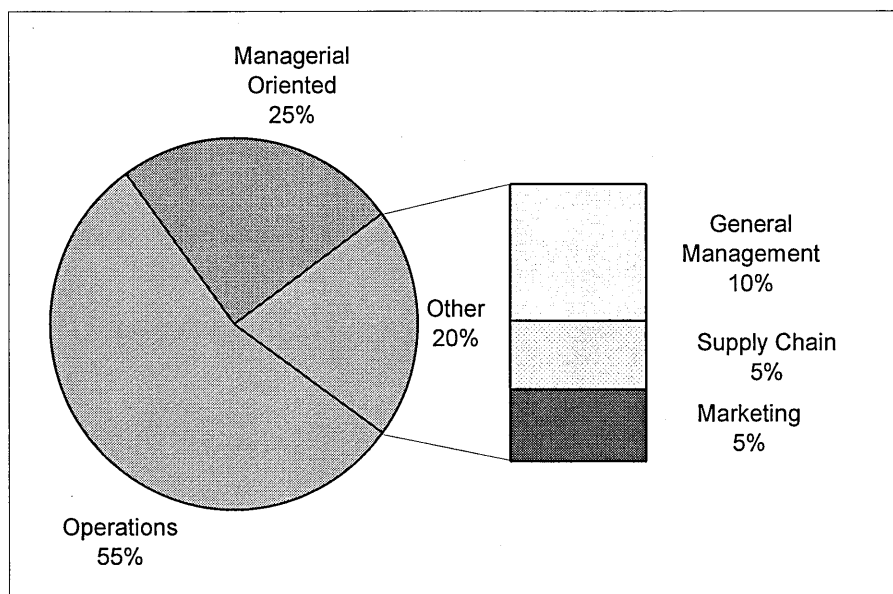


Figure 3-6: Included Works in Publication Segments

3.3 Collaboration

One of the review objectives is to investigate the dynamic interplay between organisational communication processes and collaborative business relationships. Aligned with the review objective, 25 papers are included that reflect the role communication plays in business relationships, rather than a comprehensive review of collaboration as a type of business relationship. In particular, these included papers all discuss how communication facilitates collaborative business relationships. The communication here refers not only to the communication media but also to communication as a process.

3.3.1 Included Works

As stated, there are 25 works included in this part of the review (Table 3-5). The major keywords cited in the 25 works are tabulated in Table 3-6. The most frequently cited keywords are “supply chain” and “electronic data interchange”. The term “information” appears in three places: “information resources management”, “information sharing”, and “information technology”. Most of these 25 papers are empirical (Figure 3-7), which mirror the youth of supply chain management as a school of thought.

Table 3-5: List of Included Works

AUTHOR
Abecassis & Caby (2000)
Akkermans, Bogerd & van Doremalen (2004)
Angeles & Nath (2001)
Attaran & Attaran (2002)
Bal, Wilding & Gundry(1999)
Chen & Paulraj (2004)
Claycomb & Frankwick (2004)
Crotts, Aziz & Raschid (1998)
Ellinger, Daugherty & Plair (1999)
Golicic, Davis, McCarthy & Mentzer (2002)
Hill & Scudder (2002)
Larson & Kulchitsky (2000)
Moberg, Cutler, Gross & Speh (2002)
Ovalle & Marquez (2003)
Prahinski & Benton (2004)
Raghunathan & Yeh (2001)
Rishel, Scott & Stenger (2003)
Shore & Venkatachalam (2003)
Skjoett-Larsen, Thernoe & Andresen (2003)
Stefanson (2002)
Tang, Shee & Tang (2001)
Ulaga (2003)
Vlosky & Smith (1993)
Xu & Dong (2001)
Yu, Yan & Cheng (2002)

Table 3-6: Major Key Words Cited in the Included Work

Alliances	2	Electronic data interchange	6
Buyer-seller relationships	2	Information technology	2
Suppliers	5	Information sharing	3
Logistics	3	Electronic commerce	2
Industrial procurement	5	Information resources management	1
Supply	2	Supply chain	21

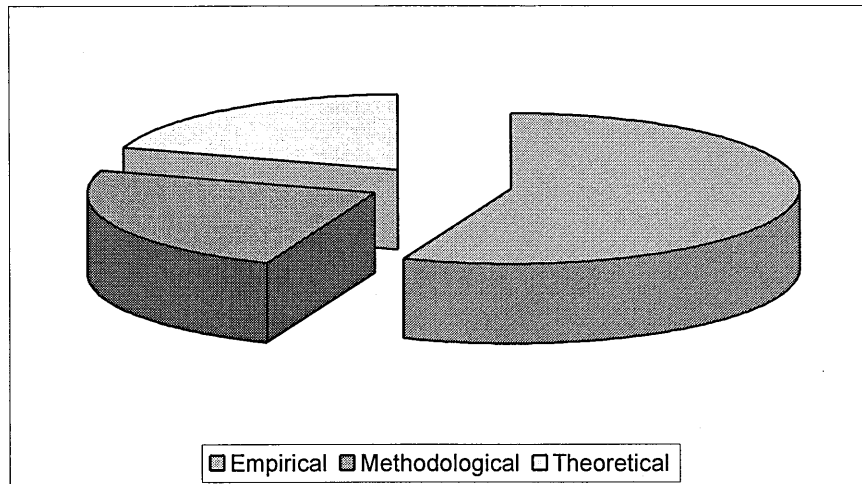


Figure 3-7: Types of Included Works

3.3.2 Demography of Included Works

Among these 25 works, 36% are published in logistics journals and 28% in operation journals (Figure 3-8). Most of these 25 works are produced after 2000 (Figure 3-9), which reflects the fact that more industrial application of information technology is adopted in business practice when it generates a generous return to cover investment. The lowering of costs by having information technology connecting with business partners and the wider adoption of information technology in business practices are two main drivers for raising the attention of discussion from both academic and managerial perspectives.

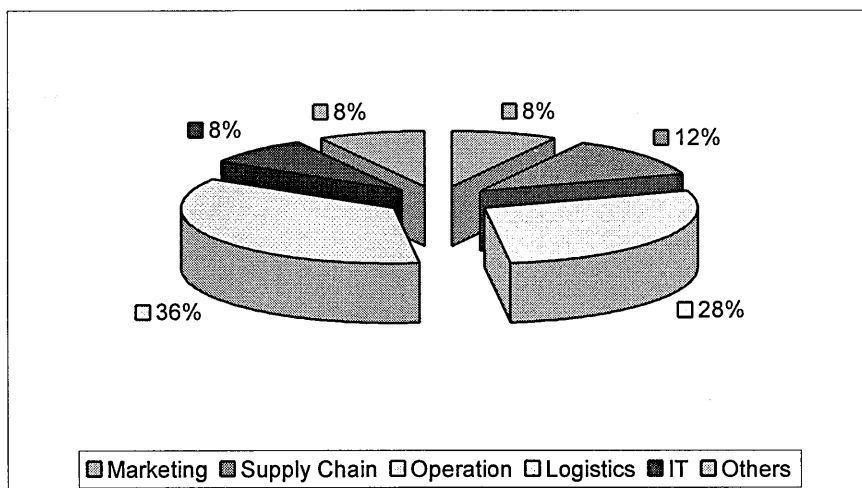


Figure 3-8: Works in Publication Segments

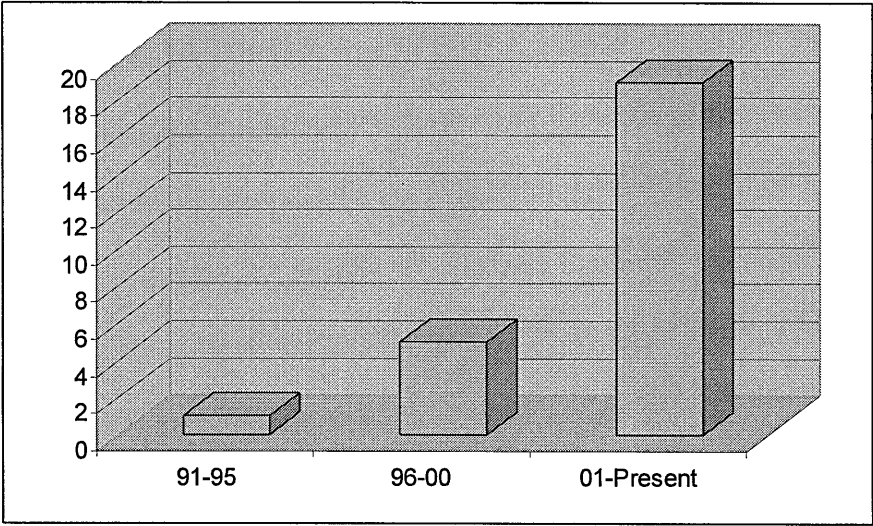


Figure 3-9: Works Produced in Each Period

Chapter 4 Thematic Findings: DCM

The thematic findings are the synthesis of the included works. In this part, demand chain management (DCM) has been discussed from three aspects: the varied definitions of DC and DCM, the enablers of DCM systems, and the benefits of having a DCM system. Based on this discussion, a conceptual framework is proposed to summarise the synthesis of the included demand chain literature.

4.1 Introduction

Demand chain is the responsive network that captures customer demand in a timely manner and effectively delivers the pursued value. Demand chain management is managing customer value through responsive network (CLSCM, Cranfield School of Management). This distinguished area is relatively new for scholars since it was coined by Brace and Gibbons in their conference paper (Brace and Gibbons, 1989). But as an emergent business model, DCM is becoming the next major frontier for effective competition (Vollmann et al., 1995).

So far most contributions to DCM have been based on best practice examples and lack a conceptual foundation (Jüttner et al., 2004). In 2002, the Journal of Operations Management presented a special issue on DCM. The contributions to this special issue attempt to present methodologies for addressing today's DCM challenges and provide directions for future research (Selen and Soliman, 2002). However, even in this special issue, there is not much consensus on the definition of DCM.

In this part of the report, the researcher tries to investigate the convergence among the discussion of DCM based on 21 included works. This investigation starts with a discussion of DCM definition, in the hope that clarification will lead to a better understanding of DC as an emerging business model and of the current voices contributing to the discussion. It is followed by a discussion of DCM enablers by breaking down each available discussion into elements (Appendix G). Then the benefits of having a DCM model are discussed. Finally, a conceptual model of DCM from this review is proposed.

4.2 DCM Definition

The term “demand chain” was initially used to replace “supply chain” and it describes “a sequence of events with but one end (customer) in view; it exists to serve the ultimate consumer” (Brace and Gibbons, 1989). It has also been elaborated by Groak (1994) in the context of modern logistics arrangements for trans-national manufacturers, and ideas were developed in Groak’s work in 1991-92 and 1992-93. Other variations for the demand chain are demand-driven supply chain (Langabeer and Rose, 2002), demand-supply chain (William, Eero, Jan and Kati, 2001), and customer-centred supply chain (Murphee, 1999). These terms address the roles of customer and supply network playing in a firm’s business, the intensive usage of information technology and internal integration (Appendix A GAppendix A H).

These definitions of DCM can be broadly categorised into four groups: DCM is the replacement of supply chain management (SCM); DCM together with SC forms a value chain; DCM is another business capability which has strategic importance in contemporary management; DCM is a type of SCM.

4.2.1 DCM as a Replacement for SCM

The first group defines DCM as a replacement for SCM. It gives DCM a separate and individual identity. These definitions in common focus on the demand as the starting point of chain activity, then the value of customer satisfaction, and also cost reduction.

A very early definition of DCM in 1989 was given as “a replacement of SCM”. It describes “a sequence of events with but one end (customer) in view; it exists to serve the ultimate consumer”. The underlying logic is that the “end-product was satisfying a perceived needs, not selling some pre-determined article” (Brace and Gibbons, 1989). Their conference paper addresses the issue of a demand fluctuation that induces higher inventory and stock-out risk. The authors proposed that partnership could lead to more transparency in demand information and thus reduce costs derived from demand fluctuation.

Scholars at IMD, Switzerland, replaced SCM with DCM based on the logic that chain focus should start with the customer and work backwards. The focus “needs to be on the final customer and the ways in which the overall chain can optimize the flow, produce maximum benefits, take out any unneeded transactions or other costs, and continually improve the bundle of

goods and services provided to all members of the chain” (Vollmann et al., 2000). The transformation of the demand chain implies a fundamentally different focus to the ways in which a company interacts with its suppliers and its customers (Vollmann and Cordon, 1998). The objective of DCM is to “develop synergy along the whole supply and delivery chain, from your suppliers' suppliers, to your customers' customers in order to satisfy the demand of the end consumers” (Vollmann et al., 1995).

DCM is defined as “the management of supply production systems designed to promote higher customer satisfaction levels through electronic commerce that facilitates physical flow and information transfer, both forwards and backwards between suppliers, manufacturers, and customers” by Williams et al. in their study of aerospace industry using a grounded approach. (Williams et al., 2001)

4.2.2 DC as Part of the Value Chain

This group defines DC as part of the value chain. DC and SC constitute the whole value chain which aims at creating and sustaining firms' competitive advantages. This idea represents the view of consultants (Langabeer et al., 2002), and promotes internal integration among marketing, sales, customer services and distribution. It is defined as “your customers, your customer's customers, the network of direct and indirect marketing, sales, and service professionals that provide you with the capability to get, keep, and grow profitable customer relationships better, faster, and bigger” (Chase, 2003). Kayser (2003) identifies four components of DCM in this line: customer relationship management (CRM), sell-side commerce, marketing and product brand information management, and he also provides the cases supporting his argument. A much better articulated report by SAP (2003) identifies that the CRM adds value to DC when DC and SC are separated. When DC and SC are integrated, the CRM adds value all the way back along the integrated value chain. By building this integrated value chain with the integration of SC and DC, firms become a customer-centric adaptive network and achieve profitability and competitive advantages.

Demand chain is the chain of activities that communicates demand from markets to suppliers and offers suppliers a wide range of opportunities

to differentiate their value offering. DCM is a value system (Jüttner et al., 2004).

4.2.3 DCM as a Strategic Capability

This view of DCM defines the demand chain (Lee and Whang, 2001) as “the complex web of business processes and activities that help firms understand, manage, and ultimately create consumer demand”. The demand chain strategy is “the direction that a firm pursues to attract and retain desirable consumers and improve its product positioning in profitable markets”. As an integrative, it is the integration and synchronisation of functional strategies. DCM is “an important capability means having a good grasp of customer demands and having a responsive system to meet those demands in a timely and cost-effective manner” (Lee and Whang, 2001). Under the logic of demand-based management, SCM achieves optimal results when integrated with demand management; and SCM leads to chaotic situation when lack of integration with demand management (Lee, 2001). Consumers must benefit from the demand-based management.

The demand chain is “a system or network of lateral and horizontal inter-linkages, reverse loops or two-way exchanges within and among the partners in the demand chain”. This paper suggests the value system as a suitable conceptual foundation for DCM and proposes the demand chain as a value system. (Jüttner et al., 2004)

4.2.4 DCM as a type of SCM

A demand chain is a supply chain that emphasises market mediation to a greater degree than its role of ensuring efficient physical supply of the product. The proposed demand chain typology is based on two dimensions of demand information transfer and relative lead time (de Treville et al., 2004).

4.3 DCM Enablers

By taking a grounded approach (Strauss et al., 1967), the researcher conducts a qualitative analysis on the discussion of DCM within the included papers. This mini piece of qualitative analysis embraces a more generic meaning of grounded theory (Partington, 2002), which is based on the coding of qualitative data. In this report, the data come from the discussion of DCM in the included papers.

As shown in Appendix E, the researcher starts building up the matrix by adding new elements of DCM while reading through the papers. Each paper discusses certain elements but not all. 14 elements are identified at the end after intensively constant contrast and comparison(Partington, 2002). Then the elements are categorised before counting the frequency of each element discussed in each category.

Table 4-1: Count of Included Works Discussing Each Element

Category	Count	Elements	Count
Agility	41	Customer Orientation	17
		Responsiveness	5
		Market Mediation	5
		Demand Pull	14
Technology-enabled Communication	25	CISs²	18
		Communication	8
Collaborative Business Relationship	20	Collaboration	10
		Integration³	10
Motivation and Control System	14	Culture	4
		Workforce	4
		Performance Measurement	6
Value Orientation	8	Value Orientation	8
Context	6	Context	6
Holistic View	7	Holistic View	7

There are seven categories identified (See Table 4-1) and they are agility, technology-enabled communication, collaborative business relationship, motivation and control system, value orientation, context and holistic view. The highlighted two categories are closely linked with the second part of the report, in which the dynamic interplay between technology-enabled

² CISs: Computer-mediated Communication and Information Systems (Rice and Gattiker, 2001)

³ Integration: the combination of two or more companies under the same control for their mutual benefit, by reducing overheads, capturing a larger market share, pooling technical or financial resources, cooperating on research and development, etc. In horizontal (or lateral) integration, the businesses carry out the same stage in the production process or produce similar products or services; they are therefore competitors. In a monopoly, horizontal integration is complete, while in an oligopoly there is considerable horizontal integration. In vertical integration, a company obtains control of its suppliers (sometimes called backward integration) or of the concerns that buy its products or services (forward integration). (Pallister and Isaacs, 2002)

communication and collaborative business relationship is systematically reviewed.

In this part of the report, the researcher will discuss these seven categories in turn. These highly discussed elements and categories reflect the convergence of the researches in DCM and they are the foundation of the proposed conceptual model at the end of this chapter.

4.3.1 Agility

Agility is “a business-wide capability that embraces organisational structures, information systems, logistics processes and in particular, mindsets” (Christopher and Towill, 2001). The key characteristics of agile practice are flexibility and responsiveness. Therefore agility can be defined as “the ability of an organisation to respond rapidly to changes in demand, both in terms of volume and variety”(Christopher, 2000). In DCM discussion, authors address agility from four aspects: customer orientation, responsiveness, market mediation and demand pull. These four aspects, discussed below, effectively increase firms’ market sensitivity. Market sensitivity means that the chain is capable of reading and responding to real demand (Christopher, 2000). In volatile and unpredictable market conditions, market sensitivity increases responsiveness and improves customer service level, therefore is essential for order winning (Christopher and Towill, 2001; van Hoek, 2001).

- Customer Orientation

The DCM business model is customer focused and orientated to satisfy customer’s diversified demand in a timely manner. The objective of DCM is “to develop synergy along the whole supply and delivery chain, from your supplier’s suppliers, to your customers’ customers in order to satisfy the demand of the end consumers” (Vollmann et al., 1995). All the effort among the DC partners is to ensure the delivery of the right products, in the right quantity, and at a profit-maximising price (Langabeer and Rose, 2002). Basically supply chain management (SCM) business model does the same thing successfully in terms of the delivery of product to the customer, but SCM focuses on efficiencies and supply while DCM focuses on effectiveness and demand (Langabeer and Rose, 2002).

Customer orientation starts from the identification of customer needs. In Heikkilä's (2002) study of the telecommunications industry player Nokia, the author puts the emphasis on customer needs and adopts it as the starting point for DCM. In his study, the performance of DCM is measured by customer satisfaction and operation efficiency. His study explores how to combine efficiency with customer satisfaction and proposes that supply chain improvement should start from the customer end.

Customer orientation is achieved through early access of customer demand information and flexible manufacturing systems. Holmström et al., (2000) propose the concepts of order penetration point (OPP) and value-offering point (VOP), which effectively illustrate how early access of demand information can add value to the chain activities if coupled with a flexible manufacturing system.

Another approach to achieve customer orientation is to treat the customer as a partner. Through the integration of SCM and CRM, customers are involved in the process at an earlier stage. Customers are involved by conducting "value exchange" with the customer, by identifying high-value customers and customisation, by building trusted advisor relationship with customers (SAP, 2003).

- Responsiveness

Increased responsiveness improves firms' competitiveness as the demand for many products is shifting from functional to innovative (Fisher, 1997). Responsiveness requires the fluid flow of demand information and materials. Today, the flow of information is imperative in DCM (Lummus and Vokurka, 1999) and the information flow should be able to boost ultra-fast material and decision flows (Korhonen et al., 1998).

De Treville et al. (2004) employ "demand integration" to facilitate the transfer of demand information and consequently enhance the responsiveness to changing customer needs. In the Nokia case, responsiveness is achieved through local supply without sacrifices of flexibility through reallocation of global resources in line with market and customer demands at any given time (Korhonen et al., 1998). In retailing cases (Lee and Whang, 2001), responsiveness is achieved through capturing and using demand information to respond to actual customer demands quickly and accurately. The

responsive planning and logistics systems allow retailers to transform information into profit.

- Market Mediation

Market mediation is used as a supply chain strategy that focuses on the effectiveness of meeting customer needs rather than operational efficiency (Fisher, 1997). The purpose of market mediation is to read market signals correctly and mediate the demand knowledge within the value system (Jüttner et al., 2004). Market mediation involves adjusting production to match actual demand and often results in lowered production efficiencies. De Treville et al. (2004) define DCM as “the supply chain that emphasizes market mediation to a greater degree than its role of ensuring efficient physical supply of the products” (de Treville et al., 2004).

Childerhouse et al. (2002) link market mediation with product life cycle in their study of the UK lighting industry. In this study, they investigate the evolution of demand chains over an extended period of time in a UK lighting company. They study answers to the question “what focused demand chain is appropriate for which product?” This case study illustrates the contingency of demand chain and the determinants of the adoption of a market mediated demand chain.

Williams, Maull and Ellis (2002) identify the drivers of demand chain management and the capabilities that firms should adopt to best respond to the various drivers by case studying the aerospace industry. They conclude that a strategic planning approach is needed to help practitioners choose and prioritise the drivers, and effectively make the trade-off between effectiveness and efficiency.

Van Landeghem and Vanmaele (2002) propose the method of robust planning at tactical planning level within the demand chain. By using this planning method, practitioners can make decisions and trade-offs of efficiency and effectiveness when taking uncertainty on board. The authors also demonstrate this planning method in the famous beer game and test it in a global enterprise: Huntsman polyurethane. This method also contributes to a better communication process along the demand chain by “reducing the number of re-planning messages and disturbances that need to be

communicated” (van Landeghem and Vanmaele, 2002) with the facilitation of intensive use of EDI.

Heikkilä’s (2002) study of Nokia Networks puts customer satisfaction as the starting point of demand chain management. The demand chain adapts the offering based on a wide range of customer situations and needs. The achieved customer satisfaction leads to higher demand chain efficiency. Customer satisfaction and demand chain efficiency are the two sides of the coin. Market mediation can be achieved without the sacrifice of efficiency. The author concludes that “understanding the customer’s situation and needs together with the right offering contributes to good co-operation in improving the joint demand chain, which further leads to superior demand chain efficiency and high customer satisfaction” (Heikkilä, 2002).

- Demand Pull

Demand pull is another widely accepted element of the demand chain management model as well as customer orientation. The common view is that demand pull is vital for surviving under the pressure of cost reduction and customer intimacy enhancement in the competition. Demand chain management is a vital capability which means having a good grasp of customer demands and having a responsive system to meet those demands in a timely and cost-effective manner (Lee and Whang, 2001).

The focus and starting point of planning and controlling in supply chain management is the material supply push, while in demand chain management it is the end user demand pull (Korhonen et al., 1998). Demand pull, unlike supply push, means producing and delivering the right product at the right time based on the “moments of information” (Lummus and Vokurka, 1999). Real pull control can only be achieved by using timely end-user demand information as a pull trigger from end users to suppliers as a primary planning and execution source (Korhonen et al., 1998).

The college textbooks demand chain in the study of Holmström et al. (2000) illustrates well the demand pull mechanism in the demand chain model. By pushing the VOP further up the demand chain to the point where students taking the instructor’s course buy only the material needed online, the OPP is driven down the point where the copyright is settled with the publisher. This assemble-on-demand system brings benefits to all the chain

partners and simultaneously enhances the level of services and customer satisfaction.

Demand chain management is not only about the demand pull system, but is also about the realisation of the full demand potential. Since demand brings customers and suppliers closer, firms should treat demand as strategic intelligence. Real time and faster-to-respond demand information should force mass customisation to become a reality (Langabeer and Rose, 2002). Demand drives key category management and marketing decisions, and demand boosts long-term profitability adding value for employees and shareholders. (Langabeer and Rose, 2002).

4.3.2 Technology-enabled Communication

Technology-enabled communication refers to the communication process facilitated by computer-mediated communication and information systems (CISs). The media of the communication process is through information technology. The CISs combine four major components⁴: computing, telecommunication network, information or communication resources and digitisation of contents (Rice, 1987). In the included demand chain literature, CISs mainly refer to the timely information sharing systems and quick decision-making systems.

▪ Communication Media

The idea of demand chain management is based on the principle of using demand instead of supply as the factor integrating the information needs in the supply chain (Vollmann, 1996). The key in demand chain management is the continuous flow of the demand information from customers and end users through distribution and manufacturing to suppliers (Korhonen et al., 1998). The information flow in demand chain management can be described as “timely, thick, meaningful and transparent” and it means capturing the market and the end user demand information in an accurate, timely (real time) and relevant manner (Korhonen et al., 1998).

⁴ Computing allows processing of content and structuring of communication participation; telecommunication networks allow access and connectivity to many others and to varieties of information across space and time; information or communication resources range from databases to communities of potential participants; digitisation of content allows the integration and exchange of multiple communication modes—such as graphics, video, sound, text—across multiple media and distribution networks (Rice, 1987).

Lummus (1999) describe the information flow in demand chain management model as “the moments of information” which, in essence, reflects the nature of real time information transferring. This information has to allow time to sense that there is a change in demand and information which allows companies to respond to the change (Lummus and Vokurka, 1999). In Lummus’ view, the information exchange also includes one between marketing and the supply chain in terms of forecasts of demand and promotion activity.

Hence the information exchanging and sharing system in demand chain management is an integrative information network together with integrated inventory planning systems across marketing and supply chain functions. When information is considered as an integral part of a responsive network, such information systems should also be “regarded as an essential ingredient to provide the customer and supply chain partners with the ability to see, know, anticipate, model, link, and trade off available resources (David, 1993). This information system is characterised “by its ability to provide accurate and relevant information to enhance the performance of the supply chain network” and supports the information interchange between the customer and the entire supply chain, resulting in the enhancement of responsiveness and flexibility of the firms (Lau and Lee, 2000).

- Communication as a Process

While there are ample research activities related to the media of communication process in the demand chain model, studies concerned with the human interaction within the communication process have not received the attention they deserve. In the included demand chain literature, there are some studies treating communication as an interactive process facilitated by information technology.

Heikkilä (2002) discusses the communication behaviour that addresses the extent to which the information exchanged is effective in a partnership from two aspects: (1) information sharing⁵ and the level of information

⁵ Information sharing refers to the extent to which critical and proprietary information is communicated to one’s supply chain partner (Mohr and Spekman, 1994)

quality⁶ and (2) participation⁷. These information attributes are closely related and critical in enabling members of a partnership to co-ordinate their activities (Heikkilä, 2002). Heikkilä also suggests that successful supplier alliances are associated with high levels of information sharing and quality, and participation.

Vollmann et al. (2000) state that this interactive communication will be the truth when “information systems linking companies are extended from the transactions phase into the knowledge phase”. They also describe this interactive communication process as “open-ended dialogue between companies, which take place in real time, at the detailed level between those who execute the manufacturing planning and control system, with no need for the decision making to traverse hierarchical levels”. Transformation of the demand chain implies a fundamentally different focus to the ways in which a company interacts with its suppliers and its customers (Vollmann and Cordon, 1998). Developing multilevel communications among demand chain partners and having a good personal fit are keys for demand chain management transformation (Vollmann et al., 1995). Better communication at all levels, together with ongoing efforts, maintains a true partnership (Vollmann and Cordon, 1998).

In fact communication is often neglected and a lack of communication can lead to conflict in interdepartmental relations between marketing and logistics (Ellinger, 2000). In Ellinger's study, he also discovers the positive link between interpersonal communication strategy and distribution service performance. Unfortunately, he does not fully develop his argument to substantiate the statement, since communication as an intangible capability sitting in workforce skills is hard to measure (Williams et al., 2002). It requires new competencies in trust building, information system linkages and other communication mechanisms to form and improve organisational links (Vollmann et al., 1995).

⁶ Information quality includes such aspects as the accuracy, timeliness, adequacy, and credibility of information exchanged (Huber and Daft, 1987).

⁷ Information participation refers to the extent to which partners engage jointly in planning and goal setting (Mohr and Spekman, 1994).

4.3.3 Collaborative Business Relationship

Collaborative business relationship is another widely accepted enabler for DCM. The included studies that contribute to the discussion are tabulated in Appendix F. There are five manifestations of collaborative business relationship based on the included studies: internal integration, partner portfolio, supplier involvement, supplier development and customer connection. These five manifestations are sometimes mixed during collaboration implementation.

- **Internal Integration**

The discussion around internal discussion rests on two perspectives: process integration and functional integration.

Murphee (1999) notices in her journalist style report that successful customer-centred supply chain managers do meet their marketing and sales forces at regular bases, by which the supply chain manager grasps the pattern of customer demand. The process integration within these supply chains has not been institutionalised yet; it is simply the result of entrepreneurial initiatives of supply chain managers.

Korhonen et al. (1998) emphasise the importance of business process integration and the integration of a process-wide performance measurement system. By having an integrated process in place, the demand chain can achieve better visibility of materials flows, inventories and demand throughout the chain. In this way, the enterprise-wide information system can reduce the time lapses in the information flow that is directly translated into inventory. Hence the information management focus must be “shifted from general management and control to a development of the means and solutions to enable integration of cross-functional teams, key business process, performance measurement, information and knowledge—all this with a market and customer-driven focus targeting increased profitable market share” (Korhonen et al., 1998).

In the SAP (2003) report, the authors fully articulate their viewpoint of demand chain model by discussing SCM and CRM integration. The integration poses challenges for the business process, information technology and enterprise culture. As a business process, integration is accomplished by “identifying links between SCM and CRM, then redesigning work processes to

facilitate communication between them, also in rolling out of new processes to maximize SCM-CRM integration” (SAP, 2003). The listed process integration tools in the report include collaborative fulfilment and available-to-promise, trade promotions management, configure-to-order, CPFR, contract management and service life-cycle management.

Jüttner et al. (2004) propose that demand chain management, in essence, comprises those activities integrating marketing and supply chain management, and that DCM is a value system. Marketing has the strength that meets the SCM limitations. The strength of marketing “lies in understanding the forces in the marketplace which affect the way in which customers perceive value (obtaining knowledge), finding out the differing needs of customer groups (market/customer segmentation), translating them into product and service packages to meet those differing needs (customised product/service development) and marketing the packages through customer value propositions (branding and communication) (Jüttner et al., 2004). Combining marketing and SCM results in the development of customer-centred supply chains (Kuglin, 1998) and customer-centred supply chain effectively is demand chain.

In Ellinger’s study of improving marketing and logistics cross-functional collaboration in the supply chain, survey results suggest that collaborative marketing and logistics interdepartmental relations can help firms provide superior service systems by developing a mutual understanding of responsibilities, sharing ideas, information and resources, and working together as a team to resolve operational problems (Ellinger, 2000). The enhancement of service levels is a firm’s competitive advantage of service-based differentiation. His study also shows significant positive association between effective marketing/logistics interdepartmental relations and distribution performance.

- Partner Portfolio

Vollmann et al. (1995) raise a question when they discuss DCM transformation: what entities are competing against each other? Their argument is that firms compete against each other through their suppliers and customers. The suppliers’ and customers’ successes can be translated into focal company’s success. Hence “the mutual dependency of the firms in the

chain mandates that DCM choice should be seen in a strategic context” (Vollmann et al., 1995). They propose to have a portfolio approach to choose DCM partners, where classes of customers and suppliers are defined and managed accordingly. The suppliers and customers in the portfolio should have distinctive competences, compatibility, and good chain relations with downstream suppliers (Vollmann and Cordon, 1998). A company has to continuously improve its performance in order to sustain a demand chain partnership over time (Vollmann et al., 2000).

In the SAP (2003) report, the ecosystem of customer-centric adaptive network (CCAN) is a technology-enabled collaboration between an individual company and its partners, suppliers, and customers. The main driver behind the formulation of this intimate and co-dependent adaptive network is the increasing complexity and speed of business. In the CCAN, the activities are emphasised around the customer, and constantly aligned with customer needs and demand in a real time manner. The selection of CCAN partners is based on the ability of potential partners to provide proficiency across customer intimacy, product leadership and operational excellence.

Since the DCM is a dynamic and evolving system, the relationship among DCM partners is dynamic and it involves mutual adaptation behaviour. In Jüttner et al.’s (2004) study, they use the life cycle of the value creating process to analyse the dynamics of this mutual adaptation behaviour. In the DCM value system life cycle, “decisions about when and how to integrate and connect relationships in order to change and optimise the structure of the whole system need to be made” (Jüttner et al., 2004).

The partner portfolio, in essence, is the supplier selection process. The major differences between partner portfolio selection and supplier selection are the participants, the selection criteria and the purpose.

Portfolio selection includes the selection of both suppliers and customers. The purpose of partner portfolio selection is to gain competitive advantage through partnering with new suppliers and customers. These suppliers and customers do not necessarily contribute to the firm’s profitability in the short-term, but in the long-term, these partners contribute not only to the firm’s profitability but also to its sustained competitive advantage. Portfolio selection is a strategic decision to make after thinking

about “with whom to compete against whom” and “with what to compete”. Hence the selection criteria are at a more strategic level and the way of working is more collaborative.

Supplier selection includes only the selection of suppliers. Customers comprise the party in the outer circle. The purpose of supplier selection is to achieve short-term profitability by selecting the most appropriate suppliers in terms of cost and capabilities. Hence the selection criteria are more at operational level and the way of working is more arm’s length.

- Supplier Involvement and Development

Supplier involvement is different from supplier development. In supplier involvement, suppliers are actively involved within the activities of their customers and they work together to develop new competence. The communication between them is intensively bilateral and deemed high quality and high participation, their relationship is interactive and stimulating. However, in a supplier development programme, suppliers have to comply with the standards that customers set or have to work towards these standards. The communication is normally directed from customer to supplier for the purpose of developing suppliers’ capabilities. The customers have much more initiative in the relationship.

Murphee (1999) portrays the supplier involvement as “intimate supplier relationships”. In this relationship, customers and suppliers create trust, and work together. They have a mutual understanding of the expectations and needs of the relationship. When effectively developing these relationships, customers leverage the suppliers’ knowledge and overall capability for joint improvement (Vollmann et al., 2000). In the case of Harley-Davidson (Murphee, 1999), they leverage their suppliers’ knowledge and overall capability to the point where the suppliers are capable of designing and developing products for them. As a result, their suppliers have full-time onsite designing components and provide support.

In Vollmann et al.’s (1998) study, they discuss the forms of supplier involvement that are regarded as the tools of DCM transformation. The category management is an activity of Effective Consumer Response (ECR) and it is the first tool to transform SCM to DCM. The category captains are the chosen suppliers in the corresponding categories and they act on behalf of the

retailer to coordinate the retailer's shelf assortment and replenishment process. Vendor Managed Inventory (VMI) is the next tool in DCM transformation. In VMI, it is the responsibility of suppliers to have materials available for the customer's use which are only invoiced when used by the customer (Vollmann and Cordon, 1998). Suppliers and customers work together to reduce the chain costs. The Early Supplier Involvement (ESI) is the last tool for DCM transformation. The objective of ESI is the time compression of a new product development cycle. ESI can unlock the cost at the design stage through supplier's involvement from the product design stage. This involvement necessitates the redesign of workflows and rules, and requires new infrastructures in place.

- Customer Connection

Customer connection is about the interface between the chain and the customer. In a traditional supply chain model, the customer does not include the end user. Although satisfying the need of end users is the whole purpose of the supply chain activities, end users are separate within the chain and serve as the end of the mean. However, in the demand chain model, the end users are part of the chain and they are literally functioning within the information loop. Hence connecting with customers is imperative and has to be done "any way you can" (Murphee, 1999).

There are techniques to build up the connection with customers at operational level, e.g. having in-plant representatives (Vollmann and Cordon, 1998). But more importantly, the demand chain has to be structured to incorporate the end users. CCAN is aligned with the customer on a real time basis. Since it is the integration of SCM and CRM, the customer is integrated into the chain through CRM activities.

4.3.4 Motivation and Control System

According to Ouchi, there are three organisational control strategies: bureaucracy, market and clan (Ouchi, 1979). Bureaucratic control is the use of rules, policies, hierarchy of authority, written document, standardisation, and other bureaucratic mechanisms to standardise behaviour and assess performance. Clan control is the use of social characteristics, such as corporate culture, shared values, commitment, traditions, and beliefs, to control behaviour. There are three motivation and control mechanisms are

identified from the included works: the clan control of culture, the bureaucratic control of workforce and performance measurement.

Culture as a clan control strategy is rather intangible. It depends on the firms' capabilities and resources resting on human capital and organisational structure that promote the functionality of the business and its ability to adjust to changes in the business environment (Williams et al., 2002). As a demand chain system, demand-driven cultures and values need to be established and shared throughout the entire chain (Langabeer and Rose, 2002). A culture that supports joint endeavours across functions is also needed (Ellinger, 2000). At last, culture as a control strategy requires firms unlearning many existing practices with their zero-sum thinking (Vollmann et al., 1995), as Weick said "treat memory as pets".

The bureaucratic control strategies are having right workforce and performance measurement. The DCM system needs to have the right performance measurement to motivate and cultivate the workforce so that they are more and more compatible with the principles of DCM in the long-term. The workforce are the institutionalised persons who individually and collectively carry out the DCM activities. They need to have distinctive capabilities so that they can perform effectively when empowered, e.g. leadership (de Treville et al., 2004; Williams et al., 2002). There also need to be new positions within DCM, that can reflect the need for capturing customer demand, e.g. a demand manager who has intensive knowledge of customer demand and has the authority to coordinate demand alignment activities (Langabeer and Rose, 2002).

The right and effective performance measurement system is necessary to gauge the quality of workforce and performance of the partners. Collaborative key performance indicators (KPIs) across functions and chain partners are a powerful tool for the reshaping process. Flawless execution of DCM begins with good performance in terms of internal measures and this internal focus needs to be expanded across the chain (Vollmann et al., 2000). Contrary to this holistic view, Langabeer et al. (2002) propose to measure only the performance of key retailers, suppliers and distributors, rather than all the participants. The measured parts of the demand chain are the key parts that can improve performance significantly and subsequently improve demand

chain profitability (Langabeer and Rose, 2002). In cross-functional evaluation and rewarding, performance measurement has to be aligned with business strategies and not only based on individual performance (Ellinger, 2000).

4.3.5 Value Orientation

One of the demand chain objectives is value enhancement (Vollmann et al., 2000). DCM is a value system, which is “a configuration of interdependent actors who raise the total value of the system by interactive value creating processes and increase the value shares of the actors” (Wehrli and Jüttner, 1994). Jüttner et al. (2004) propose the value system as the conceptual foundation of DCM, in the way which the role of marketing within DCM is defined. In their model, there are three design variables when looking at the demand chain as a value system: defining the level of integration, defining the level of adaptation to marketplace dynamics and defining the level of differentiation (Jüttner et al., 2004).

In Hines et al.’s study, they propose an integrative approach to studying DCM. Namely this integrative approach “draws four complementary management areas of process-based lean management, strategic cost management, marketing and policy deployment” (Hines et al., 2002). The key principal of lean thinking is understanding customer value and the value stream that adds this value. This understanding is the starting point of the proposed integrative DCM system, which reflects the nature of DCM in terms of its closeness to customer needs and customer perceived value.

In the SAP (2003) report, the integrated value chain starts from the integration of SCM and CRM within firms, and moves into the creation of customer-centric adaptive networks. When CCAN is accomplished, the disconnection between SCM and CRM is eliminated and value (especially in the form of CRM insights) can be infused across the entire value chain. From their point of view, every chain member has to deliver value added activities when a demand chain is seamlessly operated. The value is that which is perceived by customers and all chain activities have to be aligned with it. The report describes it as “real time customer alignment” within customer-centric adaptive network.

4.3.6 Context

Demand chain is context specific. There is no unified therapy in DCM. In DCM, “the dual objective of cost reduction and value enhancement means that some best practices focus on simplifying the chain; others attempt to improve the effectiveness of the entire chain” (Vollmann et al., 2000). Lee and Whang (2001) provide two best practices within DCM, which demonstrate how they use different levers to excel in certain environments. These best practices are the early empirical evidence to prove that the demand chain is context specific, but they have not substantiated their argument theoretically.

The theoretical discussions of Jüttner et al. (2004) and de Treville et al. (2004) provide a more systematic understanding of the contingency of the demand chain. In Jüttner et al.’s conceptual framework of the demand chain system, the focus firm has to define the levels of integration, differentiation and adaptation to marketplace dynamics. The purpose of taking this differentiated approach to the demand chain is to meet the differing needs of customer segments. The manifestations of the demand chain are therefore proliferated. De Treville et al. (2004) propose a demand chain typology according to the market mediation of the chain. There are two dimensions defining the level of market mediation of a particular demand chain, e. g. demand information transfer and the relative lead-time it needs.

Methodologically, Childerhouse et al. (2002) propose a framework for the development of focused demand chains. They adopt the classification scheme of DWV3 (Christopher and Towill, 2001) to classify product demand chains. This methodology of focused demand chain is then implemented in a UK lighting company case. The underlying rationale for this methodology is based on the premise that modern day marketplaces have diverse requirements for alternative products and services and no single demand chain strategy can best serve all these requirements. Hence “focus is required to ensure demand chains are engineered to match customer requirements” (Childerhouse et al., 2002).

4.3.7 Holistic View

Holistic view in the demand chain refers to the law that the whole is greater than the sum of the individuals. This holistic view is reflected explicitly at strategic level and implicitly at operational level in these studies. At a

strategic level, Childerhouse et al. (2002) propose to have a holistic demand chain strategy and Hines et al. (2002) take a holistic approach to define DCM.

In the integrated framework for the development of focused demand chains in the study of Childerhouse et al. (2002), a holistic demand chain strategy has to be established before any further actions are taken. This holistic demand chain strategy “leads from highlighting of core competencies and resources”, and its primary purpose is “the identification of specific markets to be targeted plus the overall corporate strategy” (Childerhouse et al., 2002). This strategy sets the tone for identifying specific products and their related service levels, which are tailored to the target markets and emphasise the important trade-offs to be made in each focused demand chain.

Hines et al. (2002) also take an integrative approach to define demand chain management. Their approach incorporates four complementary management areas of process-based lean management, strategic cost management, marketing and policy deployment. Their argument is that “an integrated or holistic process-based approach is the most effective way to drive companies towards a competitive advantage” (Hines et al., 2002).

At operational level, some studies discuss the “synergy” across the demand chain. The objective of DCM is to “develop synergy along the whole supply and delivery chain in order to satisfy the demand of the end customers” (Vollmann et al., 1995). The DCM synergies are twofold: a reduction of cost and an increased value of the bundle of goods and services provided. One way to create synergy is to choose DCM partners with distinctive competencies, and they are aligned and reinforce each other (Vollmann et al., 1995). Jüttner et al. (2004) also argue that DCM as a value system captures well the synergy between SCM and marketing. DCM can “leverage the strengths of marketing and SCM to meet the challenges of customer value creation” (Jüttner et al., 2004).

4.4 DCM Benefits

There is no particular paper that discusses the benefits of DCM. The benefits listed below are consolidated across the included works. There are two categories of benefit: strategic and operational.

4.4.1 Strategic Benefits

The strategic benefits of the DCM system refer to the capabilities that DCM introduces to the firms. These capabilities are more concerned with firms' long-term sustainability in the volatile market.

- **Competitive Differentiator**

Holmström et al. (2000) propose that by moving both OPP and VOP backwards through the chain, firms are able to compete with differentiated value offerings. These offerings will be fundamentally different between competitors and prove to be better value for money.

- **Industry Leadership**

DCM is not only about efficiency but also profitability and industry leadership is in terms of both. In extreme situations, some product demand chains can achieve both; sometimes it can be the trade-off of efficiency and profitability.

- **Extended Enterprise**

In the demand chain, there is intensive use of information technology. The intensive information exchange and closely bonded social ties among partners blur the boundaries of firms. Firms compete against each other based on their demand network rather than as a single firm.

- **Customer Intimacy**

The intensive sharing of real time demand information equips the chain with the capability to target small segments and customise the value offering. The customers' needs are then satisfied imperatively and proactively.

4.4.2 Operational Benefits⁸

The operational benefits of the DCM system refer to the capabilities that the DCM system introduces to the firms. These capabilities are concerned with the firms' recent profitability. But in the long run, these capabilities can be transformed into strategic capabilities.

⁸ See G for more details.

- Compressed Time

By adopting a demand chain approach, firms can achieve lead-time reduction, 25% planning cycle time reduction and product life cycle optimisation.

- Effectiveness & Efficiency

Intensive information transferring and sharing within the demand chain effectively eliminate the time lapse that is directly translated into inventory. By sharing real time demand information across the demand chain, customer needs are better fulfilled and customer satisfaction level improved.

- New Value Proposition

By adopting a demand chain approach, firms have attached extra value to existing product offerings or improved the service level with same costs. The value is therefore enhanced.

- Responsiveness

Responsiveness is both an enabler and a benefit of a demand chain approach. Responsiveness is increased in terms of speed and accuracy.

- Market Share

A demand chain approach can help firms increase their market share and achieve market dominance.

- ROI

The financial rewards from demand chain systems come from cost reduction by shortening lead-time and lessening inventory, and pie growing.

4.5 Proposed Conceptual Model

Based on the above discussion of demand chain enablers and benefits, a conceptual framework is proposed, see Figure 4-1. There are three major boxes and two major flows in the framework.

The three major boxes are enablers, demand chain management and benefits. In the box of enablers, the three key enablers are agility, collaboration and technology-enabled communication. These enablers are embedded in the context of organisation and gauged right through the performance measurement system. The box of demand chain management means that demand chain management is a process-based approach. This

approach transforms firms’ activities into demand chain activities and leads to the benefits of adopting DCM.

The two major flows are the reinforce flow from benefits to enablers and the synergy flow from enablers to benefits. The enablers work together and collectively achieve greater power, leading to the benefits; the benefits reinforce the synergy among enablers.

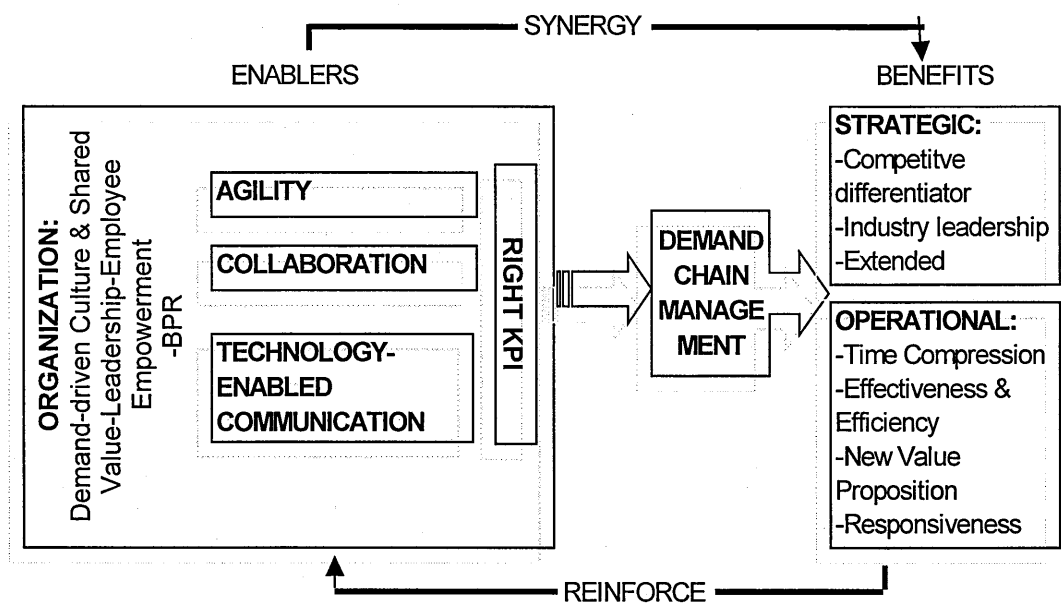


Figure 4-1: DCM Framework

Chapter 5 Thematic Findings: Collaboration from a Communication Perspective

In thematic findings, the collaborative business relationship is synthesised from a communication perspective. Hence it is not a comprehensive review of collaborative business relationships, rather it is the synthesis of how communication improves or causes the relationship to deteriorate. This mechanism is reviewed in two themes: 1) when communication refers mainly to the communication media, and 2) when communication refers to an interactive process. Before the discussion of these two themes, an overview of the collaboration and technology-enabled communication fields is presented to help the reader understand the whole picture after the introduction of the review framework.

A discussion then follows at the end of the chapter, which links the thematic findings of demand chain management with this chapter. The major trends are summarised and gaps in knowledge identified. The discussion is firmly based on the synthesis of demand chain literature and collaboration from communication literature, and leads naturally to the implications for further research that will be presented in the conclusions.

5.1 Overview

5.1.1 Collaboration

Collaboration is the phenomenon on which this review focuses. Collaboration originally means two or more people working together to achieve the same goal. More than one actor and common objectives are preconditions for collaboration at individual level. As an interorganisational phenomenon, collaboration is designed to achieve desired ends that no single organisation can achieve acting unilaterally. The preconditions and mechanism of collaboration are naturally more complex than working at an individual level. Most of the research on collaboration is oriented towards the individual focal organisation rather than toward an interorganisational problem domain (Wood and Gray, 1991).

This research studies collaboration within the demand chain, which means the organisations involved in the study are private entities pursuing

economic returns in a long run. A problem for research is why demand chain partners do not necessarily achieve their full potential of collaborative strategy when they have heavily invested in state-of-art technology to support inter-firm collaboration? In this session, after briefly discussing the literature on business relationships, discussion of collaboration from a communication perspective follows.

The research on relationship in business-to-business context is well informed by marketing literature, supply chain management literature, economics literature and network literature.

- Business Relationships in Marketing Literature

In the marketing literature, particularly in industrial marketing literature and marketing channel literature, buyer-seller relationships are characterised as interdependence when there is collaboration. Industrial marketing, in contrast to consumer marketing, i. e.: marketing to ultimate consumer, is “marketing to the organisational buyer” (Cooke, 1986). In industrial marketing, product complexity is significant in terms of the product as a set of relationships—economic, technical, and personal—between buyers and sellers. Another dimension of buyer-seller relationships is that industrial marketing and selling strategies must usually be directed toward individual customer organisations, or relatively small aggregations of customers, not “typical” customers or mass markets. For strategic purposes, the central focus of industrial marketing should not be on products or on markets, broadly defined, but on buyer-seller relationships. Relationships can vary considerably in their character, complexity, and durability, but in general it is relationships between buyers and sellers that are the hallmark of industrial marketing. These relationships involve mutual interdependence and are strategically important to both parties. Buyer-seller relationships in industrial marketing develop in the purchasing decision process and continue through negotiation of the sale and consummation of the transaction to post sale service and repeat orders. Ongoing relationships with customers are a major business asset. The sales representative plays an important role as a “boundary role person” from a marketing perspective.

Krapfel et al. (1989) propose that marketers use a process that consists of first typifying the relationship and then selecting a management mode

appropriate to that type. The resulting analysis produces the classifications of relation types and management styles. In managing the relationship, Krapfel et al. suggest that it is important that the buyer and the seller have similar or “matched” management styles. They call this the matching process. Clearly, problems will result if one treats the relationship as essentially a single transaction while the other is hoping to develop a strategic partnership. In the proposed framework, the fourth step in strategic relationship management is signalling—the exchange of information between buyer and seller to monitor and refine the management of the relationship. Signalling can establish the foundation of information and impression upon which trust, the essential bond in any strategic partnership, can be built.

Another rich source of business relationship studies is in relationship marketing. Relationship marketing refers to the development and enhancement of relationships with bodies other than external customers, such as the organisation’s own staff, as well as its suppliers, referral sources, influence markets, and recruitment markets. In contemporary marketing, the term is most commonly used to describe a long-term approach to marketing strategy, in which developing and maintaining relationships with individual customers is seen as of being fundamental importance, rather than taking a “one sale at a time” approach. It has many similarities with the Industrial Marketing and Purchasing (IMP) group’s approach to B2B marketing (Gummesson, 1987). In a six markets model, supplier and alliance market is one domain of study which takes collaborative behaviour as a precondition of relationship management. The vertical supply relationships and horizontal alliance partnerships form a closely coupled network within the six markets model.

- **Business Relationships in Supply Chain Management Literature**

Supply chain management is regarded as internal supply chain plus external supply chain. In the external supply chain, supply chain management refers to the management of dyadic relationships with immediate suppliers and the management of the extended chain of businesses including customer’s customers and supplier’s suppliers. Ellram (1991)) positions relationships in the supply chain management as a series of arm’s length contractual relationships. The interdependence of buyer-supplier relationships is

discussed by Dubois et al. (2004). Cox et al.'s (2004) generic supplier relationship management framework discuss the buyer-supplier relationship at a strategic level and Sanderson (2002) extends the framework into the supply network.

Interest in a concept of buyer-seller partnership, sometimes in the form of so-called "just-in-time" supply relationships, grew rapidly in the 80's (Frazier et al., 1988). These are modelled on the Japanese "kanban" systems of procurement. A few vendors, or perhaps even a sole source, collaborate with the buyer across multiple business functions including manufacturing, engineering, design, procurement, and marketing. The vendor is actively involved in the design of the product and the development of specifications. Blanket contracts and more flexible, less formalised procedures for releasing orders are common. Order quantities are likely to be smaller and shipments more frequent, in order to reduce inventory costs throughout the system. Buyers have greater reliance on fewer vendors, a commitment to zero defects, vendor participation in product design, just-in-time delivery, shared communication networks, an increased service component, and a much more complex buying decision process, involving multiple functions and management levels.

▪ Business Relationships in Economics Literature

Business relationships in economics literature is discussed in a different way, in terms of clear analytical deductive logic. It is typically discussed in a contractual environment. The buyer-supplier relationship is presumed to be independent of every other buyer-supplier relationship (MacNeil, 1980). Business relationships occurring between purchasers and vendors within business transactions is a function not only of economic gains but also of some human factors such as opportunism which TCE brings into this discussion. Opportunism is defined as "self-interest seeking with guile". This includes, but is scarcely limited to, more blatant forms, such as lying, stealing, and cheating. More generally, opportunism refers to "the incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse". When joined with bounded rationality and asset specificity, the risk of opportunism suggests that participants to an exchange may attempt to expropriate the composite

quasi rent that persuaded others to enter the exchange in the first place (Alchian and Woodward, 1988). The costs of negotiating, monitoring, and enforcing a contingency claims contract to insure against this possibility are called transaction costs. If the transaction costs of undertaking an exchange through the market outweigh the bureaucratic costs of managing an exchange within a hierarchy, according to transaction cost theory it is more efficient to coordinate the exchange within a hierarchy (Jones and Hill, 1988; Williamson, 1985). Hill (1990) followed this line of thinking and argued that “the rent that is generated by specific asset investments is dissipated by (a) opportunism, (b) the safeguards adapted to attenuate opportunism, and (c) internalisation of an exchange relationship within a hierarchy.” He concluded, “The value of the composite quasi rent that is inherent in a transaction is maximised whenever actors who are prepared to cooperate meet each other. Consequently, in the long run, the invisible hand selects actors whose behaviours are biased toward cooperation.”

▪ Business Relationships in Network Literature

Network theory is one branch of organisation theory, which is the application of social network theory into organisation studies. But there is not consensus on it. Network theory is more likely to be used to study alliance and partnering at strategic level in the context of business relationship (Hakansson and Snehota, 1989). In this context, managers’ perceptions and imputed meanings of the connectedness and embeddedness of a focal relationship to other relationships is studied as they act as key informants on its effects on their firms’ decisions and activities (Anderson, 1994).

A business network is defined as a set of two or more connected business relationships, in which each exchange relation is between business firms that are conceptualised as collective actors (Emerson, 1972). Connected means the extent to which “exchange in one relation is contingent upon exchange (or non-exchange) in the other relation” (Cook and Emerson, 1978). Granovetter (1985) introduced the concept of embeddedness to explain economic actions. There are two types of embeddedness: relational and structural. This is a connection between management and sociology. He explains that firms’ economic actions are socially embedded into a social structure. Networks, as the social context within which transactions are

embedded, have a profound impact on the behaviour of economic actors. Granovetter describes social networks and interpersonal relationships between parties to an exchange as mechanisms for attenuating opportunism. Building on Granovetter's idea, Provan (1993) proposed, "The structural properties of a network, specifically, firm-network embeddedness and overall network interdependence, create incentives for cooperation and long-term commitment while constraining opportunism". He hypothesised that "under conditions where overall network interdependence is high, the opportunism behaviour of an individual supplier relative to the dominant network buyer will decline as the embeddedness of the supplier in that network increases."

Firms in a network need to consider which particular actors, activities and resources in that network are relevant to them. This relevant part of the network is termed as network context (Hakansson and Snehota, 1989). At same time, firms need to develop network identity in order to capture the perceived attractiveness (or repulsiveness) of a firm as an exchange partner due to its unique set of connected relations with other firms, links to their activities, and ties with their resources (Hakansson and Snehota, 1989). Anderson (1994) devise the constructs of "anticipated constructive effects on network identity" and "anticipated deleterious effects on network identity".

5.1.2 Technology-enabled Communication

Research on the effects of the electronic media on organisational communication assumes that 1) communication mediated by technology filters out communicative cues found in face-to-face interaction; 2) different media filter out or transmit different cues; and 3) substituting technology-mediated for face-to-face communication will result in predictable changes in intrapersonal and interpersonal variables (Culnan and Markus, 1987). The new media diminishes sources of information present in face-to-face communication. According to Culnan & Markus (1987), these sources of information fall into three categories based upon their nature and the communicative functions they serve: regulation of interaction, perception of communication partners, and awareness of the social context of communication. The perception of media effect on cues-filtered-out could be explained by social presence theory, media richness theory, and the social influence model of technology use.

Social presence of a medium is linked to the non-verbal signals, including facial expression, direction of gaze, posture, dress, physical appearance, proximity, and orientation (Short et al., 1976). Non-verbal cues relate to specific communication functions, including mutual attention and responsiveness, channel control, feedback, illustrations, emblems, and interpersonal attitudes. Social presence is a single dimension that represents the cognitive synthesis of combinations of cues as attributed to the medium by the individual. Short et al. (1976) argue that social presence is a differential quality of each medium that describes “the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships.” They also argue that removal of visual cues impairs the accuracy of person perception that is critical to the development of trust. Where trust is impaired, there is more conflict. Specifically, the more types of cues the medium offers to person perception, the more cooperative the behaviour will be. Social presence theory proposes that mediated interaction would be less effective for highly interpersonally involved tasks, in proportion to the decreasing amount of social presence of the medium.

Media richness theory was initially formulated by Daft and Lengel (Daft and Lengel, 1984; Daft and Lengel, 1986) based on organisational information processing theory (Tushman and Nadler, 1978). Daft and Lengel proposed that communication media can be placed along a continuum of media “richness” based on differing capacities to resolve ambiguity. A medium’s richness is its information carrying capability, based on four criteria: 1) speed of feedback; 2) ability to communicate multiple cues such as body language and voice tone; 3) use of natural language rather than numbers, and 4) ability to readily convey feelings and emotions. Face-to-face is the richest communication medium, followed by telephone, written documents, teleconferencing and the computer-based system. The theory proposes that for an equivocal communication task, face-to-face meetings are appropriate, and for unequivocal messages that lean media should be used. The media capabilities need to be matched with task demands.

The social influence model of technology use proposes that media perceptions are socially constructed (Fulk et al., 1987). The processes involve at least four forms of social influence on both media perceptions and media

use: 1) direct statements by co-workers in the workplace; 2) vicarious learning; 3) norms for how media should be evaluated and used; and 4) social definitions of rationality. The theory predicts that there will be considerable variation in the perceptions and use of communication technologies and that this variation will be linked to the social process in play within the organisation (Fulk and Boyd, 1991). Since work groups are important sources of social support and regular interaction, there will be similar patterns of media use within groups and different patterns of media use across groups. Finally media choices may not be objectively rational. Mismatching will occur where social forces come into play to influence media selection.

Although new media has the effect of cues-filtered-out, they inherently have new capabilities that traditional media do not have (Culnan and Markus, 1987). According to Culnan and Markus, electronic media differ qualitatively from traditional communication modes in the following ways:

- Ways of addressing communication. Most forms of communication in organisations require the sender to specify the identity and physical location of the intended recipient. But electronic media allow a sender to address a communication to a communication space (sometimes called a “file”, a “conference”, or “bulletin board”) that can be read by any interested or authorised person.
- Memory, storage and retrieval of communication. Electronic media allows the availability of a complete written transcript of proceedings that is automatically maintained by the system. Also the ability of these systems to maintain accurate transcripts and other records of communication conducted via an electronic medium has important data collection implications (Sproull, 1986).
- Control over access to and participation in communication. Electronic media present a potential to control and manipulate communication. The final configuration of the systems also presents new possibilities of control and channel organisational communication.

5.2 Themes

5.2.1 *Overview of the Themes*

Communication is an important element of collaboration. Effective interorganisational communication can be characterised as frequent, genuine, and involving personal contacts between buying and selling personnel (Chen and Paulraj, 2004). Hence, it has been conceptualised to involve two-way communication and interaction with suppliers (Carr and Pearson, 1999; Carr and Smeltzer, 1999; Hahn et al., 1990; Krause, 1999; Krause and Ellram, 1997; Morgan and Zimmerman, 1990). Therefore, the arrangement of these communication elements discussed in collaboration literature (Figure 5-1) is along the dimension of tech-touch vs. human touch. The more left, the more technology and the more automation are involved in the process; the more right, the more richness and more human involvement in the process.

The systematic review of collaboration from a communication perspective literature has identified 25 works, which address the process how communication facilitates collaborative relationship. These 25 works are categorized into two themes.

In the first theme (See Appendix H), the phenomenon of communication in collaboration is mainly discussed as communication media that particularly refer to inter-organisational technology linkages. Works in this theme investigate the use and impact of communication media from the technological side of the communication process in buyer-supplier relationships. Media selection is also discussed in this theme.

In the second theme (See Appendix I), the phenomenon of communication in collaboration is mainly discussed as a social process, in which other aspects of communication play equally important roles in achieving the expected communication effect. Technology functions only as the hardware of the communication and it is the antecedent of successful communication. Having the right technology in place is necessary but not a sufficient condition for successful collaborative business relationships.

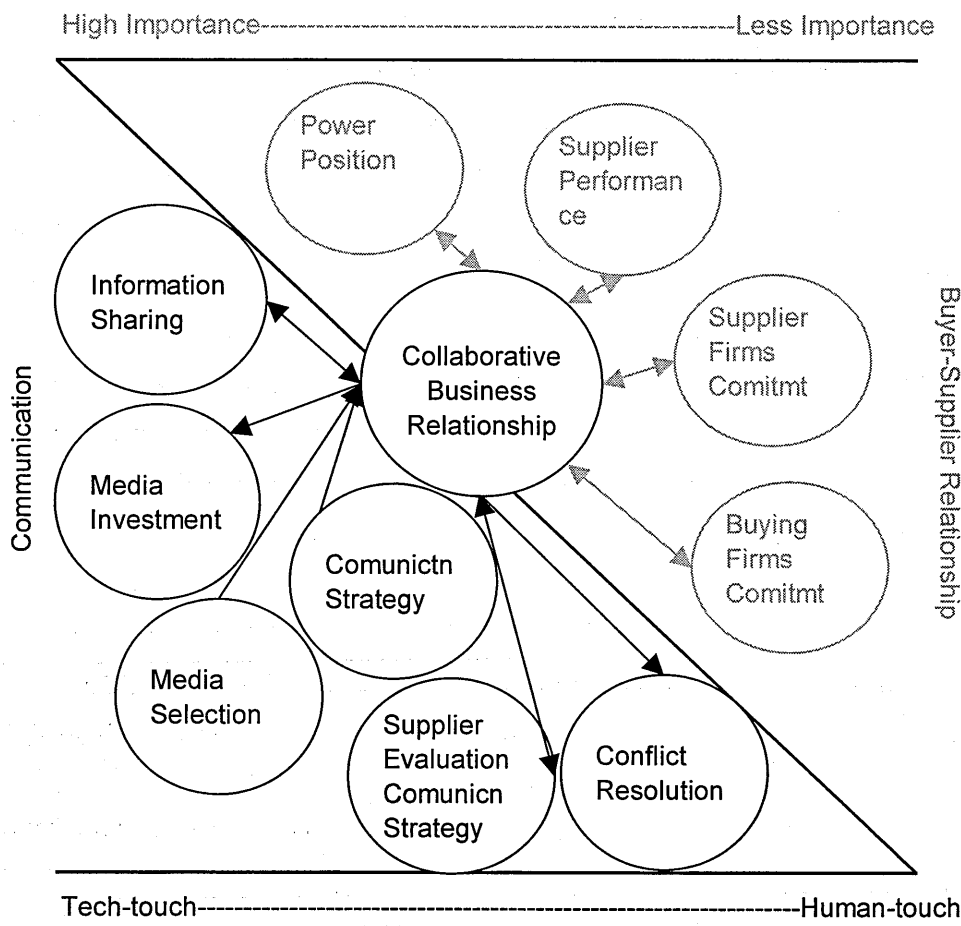


Figure 5-1: Review Framework for Collaboration from a Communication Perspective

The relationship of these two themes can be seen in Figure 5-1. This figure demonstrates the literature of collaboration from a communication perspective. The dimmer part of the figure is not discussed in this review but is relevant for understanding the included works. The left side of the figure shows the communication elements that have been discussed in the collaboration literature. It is very hard to draw a clear line between two themes. But as demonstrated in the figure, the more left, the more close to Theme 1; the more right, the more close to Theme 2.

5.2.2 Theme 1: Communication Media ⁹

In this theme, communication is discussed from a communication media perspective. It covers the types of communication media, the communication media selection, and the impact of media on relationships.

▪ Types of Communication Media

The types of communication media are summarised in Table 5-1. According to media richness theory, these media Locates at lower end of media richness continuum. These media low in richness can be used to convey objective message content. But when equivocality confronting increases, richer media are needed to resolve differences of opinion and enact shared understandings. Otherwise, more uncertainty and equivocality are generated as more information is exchanged through the media.

Table 5-1: Communication Media Discussed in the Review

MEDIA	AUTHOR
Barcoding	Larson & Kulchitsky (2000), Vlosky & Smith (1993)
Cybermediary	Tang, Shee & Tang (2001)
EDI	Larson & Kulchitsky (2000), Angeles & Nath (2001), Hill & Scudder (2002), Raghunathan & Yeh (2001), Xu & Dong (2001), Yu, Yan & Cheng (2002), Stefansson (2002), Venkatachalam (2003), Vlosky & Smith (1993)
Electronic networks	Abecassis, Caby & Jaeger (2000)
E-Mail	Larson & Kulchitsky (2000)
Fax	Larson & Kulchitsky (2000)
Internet (Collaborative computing technology, such as CP, CFAR, VMI etc.)	Stefansson (2002), Rishel, Scott & Stenger (2003), Attaran & Attaran (2002), Golicic, Davis, McCarthy & Mentzer (2002), Ovalle & Marquez (2003)
Satellite	Rishel, Scott & Stenger (2003)
Voice Mail	Larson & Kulchitsky (2000)
WWW	Larson & Kulchitsky (2000)
XML	Venkatachalam (2003)

▪ Communication Media Selection

Communication media selection is related to the equivocality associated with environmental uncertainty. Works addressing the issues of media selection are tabulated in Table 5-2.

Table 5-2: Communication Media Selection Discussed in the Review

AUTHOR	MEDIA SELECTION
Abecassis, Caby & Jaeger (2000)	Low usage of electronic networks in garment industry
Larson & Kulchitsky (2000)	Depends on the nature (strategic versus tactical) of the message being transmitted.

⁹ See H for full details of analysis.

▪ Impact of Media on Relationships

The communication media have impact on the relationship through supply chain performance improvement and uncertainty reduction. Results are summarised in Table 5-3.

Table 5-3: Impact of Communication Media Discussed in the Review

AUTHOR	MEDIA IMPACT
Abecassis, Caby & Jaeger (2000)	Emergence of electronic markets in the garment industry does not offer obvious advantages.
Angeles & Nath (2001)	EDI-enabled relationships
Attaran & Attaran (2002)	Flattened organisational structure, Coordination costs reduction, Flexible workplace, Virtual organisation, and real-time collaboration
Golicic, Davis, McCarthy & Mentzer (2002)	The impact of e-commerce on supply chain management occurs primarily through the management of relationships.
Hill & Scudder (2002)	Better coordination with suppliers, but not necessarily with their customers.
Larson & Kulchitsky (2000)	Performance: cycle time and on-time delivery
Ovalle & Marquez (2003)	Leading to prompt stability in critical variables, to the best service levels to end customers, the smallest required funds and very possibly, the highest throughput.
Rishel, Scott & Stenger (2003)	Having the benefits of better customer service, information on shipment status, more timely data, and the ability to track the carrier, reorder stops, change the end destination, and monitor and measure carrier performance when their carriers used satellite communication technology.
Stefansson (2002)	Data sharing
Tang, Shee & Tang (2001)	It becomes individual party affecting the buyer-supplier relationship dyad.
Vlosky & Smith (1993)	The electronic communication technologies represent a means of enhancing communication between buyers a sellers on a global scale, suggesting opportunities for the formation of stable, long-term international partnerships. EDI also can help dramatically in reducing some of the common barriers to conducting international trade.
Xu & Dong (2001)	Demand fluctuations can be controlled through technology-enabled collaboration within the supply chain.
Yu, Yan & Cheng (2002)	Inventory reduction and cost savings for the manufacturer between the three relationship integration levels. The information sharing-based supply chain partnership can improve the overall performance of the decentralised supply chain.

5.2.3 Theme 2: Communication as a Social Process¹⁰

The second theme is communication as a social process. In this theme, communication as a phenomenon is much more complex and rich than communication media studies. The communication process starts from the

¹⁰ See Ifor full details of analysis.

antecedents rooting in the environment. The communication effects are contingent upon the relationship variables.

- **Communication Environment**

The communication environment is discussed from aspects of 1) channel conditions and 2) common goal (See Table 5-4).

Table 5-4: Communication Environment Discussed in the Review

AUTHOR	ENVIRONMENT
Bal, Wilding & Gundry (1999)	Virtual teaming for joint projects.
Mohr & Nevin (1990)	Channel conditions: structure, climate and power
Skjoett-Larsen, Thernoe & Andresen (2003)	Defining the agenda for collaboration in terms of stabilising the collaborative goals and expanding the collaborative projects in terms of scope and complexity. Other enablers were trust in the relationship and ensuring information sharing.

- **Communication Antecedents**

The communication antecedents are multi dimensional variables, among which trust is all about the human side of the relationships (See Table 5-5).

Table 5-5: Communication Antecedents Discussed in the Review

AUTHOR	ANTECEDENTS
Moberg, Cutler, Gross & Speh (2002)	Information quality, IT commitment, Organisational size, SCM commitment, trust and commitment.

- **Communication Content**

The communication content refers to the communication messages that are transmitted from one party to another during the communication process. Communication content is one of four variables of the communication strategy (See Table 5-6).

Table 5-6: Communication Content Discussed in the Review

AUTHOR	CONTENT
Claycomb & Frankwick (2004)	Communication elements: communication quality, participation, information sharing and conflict resolution.
Ellinger, Daugherty & Plair (1999)	Vendor meeting, personal visits by senior vendor managers, formalised contact
Mohr & Nevin (1990)	Communication strategy: frequency, direction, modality and content
Prahinski & Benton (2004)	Supplier evaluation
Skjoett-Larsen, Thernoe & Andresen (2003)	In these seven dimensions: Shared information, Degree of discussion, Co-ordination / Synchronization, Competence development, Evaluation, Type of relationship, Theoretical explanation

▪ Communication Effect

The communication effect refers to the feedback from the communication processes. The impact of message senders have made on message receivers (See Table 5-7).

Table 5-7: Communication Effect Discussed in the Review

AUTHOR	EFFECT
Akkermans, Bogerd & van Doremalen (2004)	Openness and intensity of communication improve respectively information transparency and trust.
Bal, Wilding & Gundry (1999)	Enabling virtual teaming
Chen & Paulraj (2004)	Poor communication was a fundamental weakness in the interface between a buying firm and its supplier, and this undermines the buying firm's efforts to achieve increased levels of supplier performance.
Claycomb & Frankwick (2004)	The impact of relationship communication strategy on buyer search effort is contingent upon the duration of relationship, the importance of that relationship to supplier, buyer firm size and individual buyer's prior experience.
Crotts, Aziz & Raschid (1998)	Communication is one of seven factors that determine the level of supplier commitment
Ellinger, Daugherty & Plair (1999)	High human contact communication with customers increases customer satisfaction and subsequently customer loyalty.
Moberg, Cutler, Gross & Speh (2002)	Improvement of operational information exchange and strategic information exchange
Mohr & Nevin (1990)	Channel outcomes: coordination, satisfaction, commitment and performance.
Prahinski & Benton (2004)	When a buying firm utilises collaborative communication, the supplier perceives a positive influence on the buyer-supplier relationship.
Skjoett-Larsen, Thernoe & Andresen (2003)	CPFR should be viewed as a general integrated approach to coordination of processes between participants in a supply chain
Uлага (2003)	Communication improves personal relationships and that is a value driver

5.3 Discussion

Collaboration is a social process. The studies of collaboration from a communication perspective cannot focus only on the technical aspect of communication while ignoring the human side of communication. Current literature on collaboration discusses extensively the issues around communication media and even the technical aspects of the electronic communication media. But communication media, especially the technology-enabled communication media, normally have low richness. It has a deficiency when uncertainty is high or when communicating messages with high ambiguity. The market-place is moving towards being volatile and unpredictable. To face this challenge, treating communication only as sharing information with software packages or online is not sufficient any more. The rule of survival demands a more holistic view on communication behaviour in collaborative buyer-supplier relationships.

As identified in previous chapters, both collaboration and communication are two key enablers of demand chain management. The real essence of demand chain management is about sharing real time demand information across the chain partners in order to deliver optimal value to end customers and to the chain member themselves as well. The agility of the demand chain system is not only in data sharing, but also in coordination across the chain to respond to market demand quickly and smartly. In this situation, communication behaviour cannot be simply to share only the demand data. It also requires enormous collaborative planning, forecasting and conflict resolution activities. The communication behaviours in demand chain collaboration are those of the technology-enabled human communication, rather than just database communication. There are intensive cognitive and behavioural issues involved in this human communication system.

Chapter 6 Conclusions

This work is intended to systematically review the fields of demand chain management and collaboration from a communication perspective. Seven demand chain enablers are identified and the benefits that demand chain brings to the firms are discussed. A conceptual framework is presented to synthesise the literature. In the field of collaboration from a communication perspective, there are two themes which are reviewed according to an adapted theoretical framework. These two themes are communication as media and communication as a social process.

But there are some limitations regarding the content and methodology adopted for this review.

These two fields have different characteristics. The field of demand chain management is an emerging field. The literature is very limited and fragmented. The sources of the included works are largely recommended by experts. Hence there is no rigorous quality assessment exercised in the review of this field. The field of collaboration from a communication perspective is a field well discussed. But the discussion only focuses on the technology element of communication among buyers and suppliers. There are few studies that encompass and focus on communication as a social interaction process within collaboration. In most cases, communication is discussed as an element of a social system that shapes the collaboration structure. Hence there are no very rich studies regarding the social side of communication in collaboration.

As far as the methodology is concerned, a systematic review of evidence has been accepted and practiced in many areas, such as medical, healthcare, education, and social policy etc. But the validity of its implication in management science is still in discussion because the knowledge of management sciences is absorbed, internalised and institutionalised by individuals and society as time goes along. So the appropriateness of applying this methodology into management science is still worth considering.

The review confirms the gap in knowledge where human interaction in collaborative technology-enabled communication needs further research, both theoretically and empirically.

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II Appendices: A-K

A. Proposed Free Online Journals for the Search

- DM Review (www.dmreview.com)
- Better Management (www.bettermanagement.com)
- Supply Chain Management Review (www.manufacturing.net)
- Supply Chain Brain (www.glscs.com)

B. Quality Assessment Criteria

Value	0	1	2	3	4
Dimension	Absence	Low	Medium	High	Not Applicable
Theory Robustness	No enough information	Poor awareness of literature and debates; under or over referenced; low validity of theory	Basic understanding of the issues around the topic; theory is weakly related with data	Deep and broad knowledge of literature; good relation of theory and data	Not applicable to the paper
Implication for Practices	No enough information	Not relevant for practitioners	Potential for implementing the ideas into practice with minor revisions or adjustment	Could benefit to the practice	Not applicable to the paper
Methodology	No enough information	Flawed research design; data inaccuracy and not related to theory	Research design may be improved; data is related to the arguments though there are some gaps	Research design is robust; data support arguments	Not applicable to the paper
Generalisability	No enough information	Only to the population studied	Generalisable to organisations of similar characteristics	High level of generalisability	Not applicable to the paper
Overall	No enough information	Does not make an important contribution to the knowledge	Building upon the existing theory and extending literature	Further develops existing knowledge	Not applicable to the paper

C. Data Extraction Form

Author of the article	
Title of the article	
Document name	
Journal Title	
Source of citation	
Date of publication	
Volume	
Month or season	
Part	
Page number	
Empirical or theoretical	
Where was the study located	
What was the context/industry	
What was the sample size	
Method of data collection	
Method of data analysis	
Study characteristics	
Quality-theory robustness	
Quality-implication for practice	
Quality-methodology	
Quality-generalisability	
Quality-overall	
Database	
Location of item	
Include Y/N	
Reason for exclusion	
Key findings	
Abstract	
Sub-field of study	
Keywords	

D.List of Interesting Works on DCM but Not Included

- Christopher, M. and Peck, H. (2003), *Marketing Logistics* (2 edition), Butterworth Einemann, Oxford.
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E. Elements of Demand Chain Management Discussed in Included Works

Author	Agility				Technology-enabled Communication		Collaborative Relationship		Control & Motivation System			Holistic View	Context	Value Origin
	Custmr Orign	Respon-siveness	Market Mediatio	Demand Pull	CISInfo Sharing	Communi-cation	Colla-boration	Integrati on	PM	Culture	Work Force	Holistic View	Context	Value Orign
Brace and Gibbons(1989)	• •			• •	• •		• •							
Childerhouse, Aitken, and Towill (2002)			• •	• •					• •			• •	• •	
de Treville, Shapiro, and Hameri (2004)		• •			• •		• •				• Leader-ship		• •	
Ellinger (2000)	• •				• •	• •	• •	• •	• •					
Frohlich and Roy (2002)	• •			• •	• •	• •		• •				• •	• •	
Heikkilä (2002)	• •		• •		• •		• •					• •	• •	• •
Hines, Silvi, and Bartolini (2002)	• •			• •					• •			• •	• •	• •
Holmstrom, Louhivuoto, Vasara and Hoover (2000)	• •			• •	• •			• •						• •
Jüttner, Baker and Christopher (2004)	• •				• •			• •				• •	• •	• •
Korhonen, Huttunen and Eloranta (1998)	• •	• •		• •	• •								• • simulati on	
Langabeer and Rose (2002)	• •			• •		• •	• •	• •	• •	• •	• de/mr knldge			• •
Lee and Whang (2001)	• •	• •		• •	• •									
Lummus and Vokurka (1999)	• •	• •		• •	• •	• •		• •						
Murphee (1999)	• •				• •									
SAP (2003)	• •	• •		• •	• •		• •	• •	• •		• •			• •
Selen and Soliman (2002)	• •			• •	• •		• •					• Synerg y		

F. Collaborative Business Relationships in DCM

COLLABORATIVE BUSINESS RELATIONSHIP					
	Internal Integration Marketing & Logistics	Partner Portfolio ¹¹	Supplier Involvement	Supplier Development	Customer Connection
Ellinger (2000)					
Jüttner, Baker and Christopher (2004)	Marketing & SCM	Mutual Adaptation			
Korhonen, Huttunen and Eloranta (1998)	Business Process Integration & Integration of Process-wide PM				
Murphee (1999)	Regular Meetings with Marketing & Sales		Intimate supplier Relationship		Connection with Customers Any way you can
SAP (2003)	SCM & CRM	CCAN: Integrated Value Chain			CCAN: Real Time Customer Alignment
Vollmann and Cordon (1998)		Portfolio of Suppliers & Customers	Early Supplier Involvement (ESI) & CM & VMI		In-Plant Representatives
Vollmann, Cordon and Jussi (2000)		Continuous Transformation	Joint Improvement	Agile Supply Base	
Vollmann, Cordon and Raabe (1995)		Competing through Customers & Suppliers			

¹¹ Partner portfolio: key suppliers & customers identification and selection

G. Operational Benefits of Having DCM

OPERATIONAL BENEFITS						
	Compressed Time	Effectiveness & Efficiency	New Value Proposition	Responsiveness	Market Share	ROI
de Treville, Shapiro, and Hameri (2004)	Lead Time Reduction					
Holmstrom, Louhluoto, Vasara and Hoover (2000)		Moving OPP Backwards (Inventory Reduction)	Moving VOP Backwards	Moving OPP Backwards (Customisation)		
Langabeer and Rose (2002)	25% Planning Cycle Time Reduction	50% Inventory Reduction	Service Level Increase Up to 25%	Forecasting Accuracy Increase Up to 50%		Increase up to 10%
SAP (2003)	Product Life Cycle Optimisation	Inventory Reduction	Product Leadership			SCM-CRM Integration & CCAN
Vollmann and Cordon (1998)			Value Enhancement			Cost Reduction
Vollmann, Cordon and Jussi (2000)					Market Dominance	Pie Growing & Sharing

H.Descriptive Analysis : Communication as Media

AUTHOR	Abecassis & Caby (2000)	MEDIA TYPE	Electronic networks	MEDIA SELECTION	Low usage of electronic networks in garment industry	MEDIA IMPACT	Emergence of electronic markets in the garment industry does not offer obvious advantages.	METHOD	Interview	SAMPLING	Different kinds of actors in the garment industry supply chain in each country	SAMPLE SIZE	France: 59, US: 41	FINDINGS	Considering that the Internet might become the unique information and communication channel at the moment is a Utopia carefully driven by firms involved in Internet development. For the time being, products that take a real profit from the Internet are mainly information products or services which still target early adopters called the E-generation. The electronic networks have definite effects on transaction costs: increased reliability and control, reduced uncertainty.	INDUSTRY/ BACKGROUND	Garment Industry	LOCATION	France & US	OVERALL QUALITY	3
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Attaran & Attaran (2002)	Internet (Collaborative computing technology)		Flattened organisational structure, Coordination costs reduction, Flexible workplace, Virtual organisation, and real-time collaboration			Executives attending EDI conference	23	Effective customer-supplier EDI partnership is characterised by six congruence factors: top level strategic commitment, trading partner flexibility, joint partnering for EDI, readiness for high-level EDI implementation, EDI infrastructure, and partner communication.	Various industries	USA	2
Angeles & Nath (2001)	EDI		EDI-enabled relationships	Survey		Executives attending EDI conference	23	Effective customer-supplier EDI partnership is characterised by six congruence factors: top level strategic commitment, trading partner flexibility, joint partnering for EDI, readiness for high-level EDI implementation, EDI infrastructure, and partner communication.	Various industries	USA	3

Gollicic, Davis, McCarthy & Mentzer (2002)	e-commerce: Internet		The impact of e-commerce on supply chain management occurs primarily through the management of relationships.	Grounded theory: a theory-building, qualitative research design	Purposive: targeting companies that were chosen based on an attempt to locate the phenomenon of interest (both brick-and-click & pure-play firms.	8	The two primary dimensions of e-commerce are speed and connectivity, which create new dynamic market structures and market visibility, which then create uncertainty. Relationship management is to combat the market uncertainty. Relationships can create barriers to competition as suppliers and customers rely on those with whom they work on a continual basis.	Various industries	USA	3
Hill & Scudder (2002)	EDI		Better coordination with suppliers, but not necessarily with their customers.	Survey	American Production and Inventory Control Society (APICS)	486 (22, 46.3%)	The results show that companies would use EDI to become more coordinated with suppliers, but not necessarily with their customers. More EDI activities was seen with the customer than with the supplier. Firms may see EDI as a tool for improving efficiencies rather than a tool for developing SCM.	Food industry, heavily populated with manufacturing (70%)	USA	2

Ovalle & Marquez (2003)	Internet e-collaboration tools: CP, CPAR, VMI		Leading to prompt stability in critical variables, to the best service levels to end customers, the smallest required funds and very possibly, the highest throughput.	System dynamics modelling			Purchasing Management Association of Canada (PMAC) members	514 (338, 66%)	Timely and accurate information exchange makes for closer buyer-supplier relationships, and closer relationships improve lead time performance. Information quality also has a direct favourable impact on performance. EDI appears to have little effect on either relationships or performance. The use of various communication media by purchasing professionals depends on the nature (strategic versus tactical) of the message being transmitted.		Canada	3
Larson & Kulchitsky (2000)	Bar Coding, EDI, WWW, E-Mail, Voice Mail and Fax	Depends on the nature (strategic versus tactical) of the message being transmitted	Performance: cycle time and on-time delivery	Survey				514 (338, 66%)	Timely and accurate information exchange makes for closer buyer-supplier relationships, and closer relationships improve lead time performance. Information quality also has a direct favourable impact on performance. EDI appears to have little effect on either relationships or performance. The use of various communication media by purchasing professionals depends on the nature (strategic versus tactical) of the message being transmitted.			3

Raghunathan & Yeh (2001)	EDI				Modelling				Lead time reduction has been shown to have significant impact on information-sharing partnerships, positive lead time in our model simply increases the CRP value. There is the need for analysing correlations among retailer demands because they affect not only the overall value of information sharing but also the structure of the CRP partnerships.	Manufacturing & Retailing industries	USA	2
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Rishel, Scott & Stenger (2003)	Satellite, Internet		Having the benefits of better customer service, information on shipment status, more timely data, and the ability to track the carrier, reorder stops, change the end destination, and monitor and measure carrier performance when their carriers used satellite communication technology.	Case study	Shippers	4	Satellite communication provides firms with the ability to collaborate with customers and improve customer service. The technology provides the connectivity and visibility required for timely and responsive customer service. It can also play a major role in an integrated CRM system by collecting and transmitting the order status, tracking, and exception information shared with the customer. It enables the firms to collaborate with their customers in a time of change or crisis.	Motor carrier industry	USA	3
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Stephenson (2002)	EDI, Internet		Data sharing	Case study		20	<p>These case studies show that SMEs do not have the basic information systems to be able to implement some kind of advanced communication. They communicate only through telephone and fax. There is a need for less expensive methods of data sharing in the supply chain to make it possible for the SMEs to participate. The small companies that must join other partners in their data-sharing efforts to make better coordination possible in the supply chain.</p>	Logistics and Manufacturing	Sweden	2
Tang, Shee & Tang (2001)	Cybermediary		It becomes an individual party affecting the buyer-supplier relationship dyad.				<p>The conceptual model that represents the nature of the interaction between buyers and suppliers in the world of electronic commerce. Besides the interaction between these two parties, the important functions and roles the ISP plays in this relationship is highlighted.</p>		Taiwan	2

Yan & Cheng (2002)	EDI	<p>Inventory reduction and cost savings for the manufacturer between the three relationship integration levels. The information sharing-based supply chain partnership can improve the overall performance of the decentralised supply chain.</p>	Modelling			<p>According to the quantitative analysis of the benefits of information sharing-based partnerships, we see that the supply chain partnership can not only help the entities of a decentralised supply chain to eliminate the "bullwhip effect", but also improve the overall performance of the supply chain. The supply chain partners can use EDI to adopt a VMI strategy for inventory decision making. The manufacturer should take the initiative to establish information sharing-based partnerships and also give the retailer some incentives to induce the retailer's cooperation. To gain overall improvement of the supply chain performance, the partners should be interdependent of each other, based on information sharing.</p>	Manufacturer-retailer dyad	Hong Kong, China	2
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Venkatachalam (2003)	Network infrastructure: XML, RPA				Modelling			A methodology to determine the supplier's capability in information sharing which comprise technical data and social / organisational data.		USA	3
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I. Descriptive Analysis: Communication as a Social Process

AUTHOR	ENVIRONMENT	ANTECEDENT	CONTENT	EFFECT	METHOD	SAMPLING	SAMPLE SIZE	FINDINGS	INDUSTRY/ BACKGROUND	LOCATION	OVERALL QUALITY
Bal, Wilding & Gundry (1999)	Virtual teaming for joint projects.			Enabling virtual teaming	Survey	Suppliers to Rover Group	300 (70, 23.3%)	Virtual teaming is becoming	Automotive	UK	3
Alkermans, Bogerd & Doremalen				Openness and intensity of communication improve respectively the information transparency and trust.	Case study		1		Hi-tech electronic	The Netherlands	2

Ellinger, Daugherty & Plait (1999)					Vendor meeting, personal visits by senior vendor managers, formalised contact	High human contact communication with customers increases customer satisfaction and subsequently customer loyalty.	Survey	Firm's customer database	230 (99, 43%)	Firms proactively seeking	Manufacturing	USA	3
Crotts, Aziz & Raschid (1998)						Communication is one of seven factors that determine the level of supplier commitment	Survey	Small tourism business in New Zealand	220 (140, 64%)	Seven variables are associated	Tourism	USA	2
Claycomb & Frankwick (2004)					Communication elements: communication quality, participation, information sharing and conflict resolution.	The impact of relationship communication strategy on buyer search effort is contingent upon the duration of relationship, the importance of the relationship to supplier, buyer firm size and individual buyer's prior experience.	Survey	Midwest chapter of the Institute for Supply Management	1002 (174, 17.7%)	Four contingency variables (duration of a relationship, importance	Manufacturing	USA	3
Chen & Paulraj (2004)						Poor communication was a fundamental weakness in the interface between a buying firm and its supplier, and this undermines the buying firm's efforts to achieve increased levels of supplier performance.	Survey	The sample frame consisted of members of the	954 (232, 24.3%)	Effective inter-organisational communication can		USA	3

Skjoett-Larsen, Thernoe & Andresen (2003)	Defining the agenda for stabilising the collaborative goals and expanding the collaborative projects in terms of scope and		In these seven dimensions: Shared information, Degree of discussion, Co-ordination / Synchronisation, Competence development, Type of relationship, Theoretical explanation	CPFR should be viewed as a general integrated approach to coordination of processes between participants in a supply chain	Survey	Yearly revenue of more than 25 million DKK.	218 (7.6%)	CPFR can be divided into three levels depending on the integration and extent of the		Denmark	3
Prähnski & Benton (2004)			Supplier evaluation	When a buying firm utilizes collaborative communication, the supplier perceives a positive influence on the buyer-supplier relationship.	SEM		571 (139, 24.3%)	The supplier evaluation communication	Automotive	USA	3
Mohr & Nevin (1990)	Channel conditions: structure, climate and power		Communication strategy: frequency, direction, modality and content	Channel outcomes: coordination, satisfaction, commitment and performance.				They propose a contingency		USA	3
Moberg, Cutler, Gross & Speh (2002)		Information quality, IT commitment, Organisational size, SCM commitment,		Improvement of operational information exchange and strategic information exchange	Survey	The 1998 membership roster for the Council of	1179 (248, 21.03)	Information quality and relationship commitment are	Food and beverage, clothing, office	USA	3

J. Descriptive Analysis Table for DCM

AUTHOR	TITLE	JOURNAL	DATE	VOL.	NO.	ABSTRACT	KEYWORDS
Brace, Gordon// Gibbons, Anne	Market power: An imperative to co- operation		1989				COMMUNICATION in organisations/ Information Sharing/ Business Relationships

Childerhouse, Paul//Aitken, James//Towill, Denis R.	Analysis and design of focused demand chains	Journal of Operations Management	2002	20	6	<p>The paper describes the evolution of focused demand chains over an extended period of time as a major UK lighting manufacturer has sought to remain an international player in a fast changing business environment. Analysis and design procedures make use of the concepts of Wickham Skinner and Marshall Fisher to answer the strategic questions 'what facilities are required and how should they be laid out to enable the necessary focused demand chains?' and to answer the tactical question 'which focused demand chain is appropriate for this product?' The case study then details how the company has transformed from operating within a traditional supply chain to driving change via the engineering of four focused demand chains. The paper concludes with a comparison of operations enablers, customer choice, and business performance metrics covering the transition period culminating in the current focused demand chain scenario. By matching products to the appropriate value stream there is a consequential reduction in product development time of 75%; manufacturing costs reduction of up to 27%; and up to 95% reduction in delivery lead times.</p>	LIGHTING/ MANUFACTURING processes/ MANAGEMENT/ OPERATIONS research/ MANAGEMENT science/ SUPPLY chains/ GREAT Britain
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de Treville, Suzanne//Shapiro, Roy D. //Hameri, Ari-Pekka	From supply chain to demand chain: the role of lead time reduction in improving demand chain performance	Journal of Operations Management	2004	21	6	<p>To improve demand chain performance, is it better for parties in a supply chain to focus first on lead time reduction, or instead concentrate on improving the transfer of demand information upstream in the chain? Even though the theory of supply and demand chain management suggests that lead time reduction is an antecedent to the use of market mediation (i.e., adjusting production to fit actual customer demand as it materializes) [Harvard Business Rev. 75 (2) (1997) 105] to reduce transaction uncertainty in the chain, which can be conceptualized as the primary goal of supply chain management [J. Operat. Manage. 11 (3) (1993) 289], demand chain parties often are observed in practice to begin with information transfer improvement, ignoring the problem of long lead times. In this paper, we propose a framework for prioritizing lead time reduction in a demand chain improvement project, using a typology of demand chains to identify and recommend trajectories to achieve desirable levels of market mediation performance.</p>	Studies/ Supply chains/ Demand/ Logistics/ Operations research
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Ellinger, Alexander E.	Improving marketing/logistics cross-functional collaboration in the supply chain.	Industrial Marketing Management	2000	29	01-Jan	<p>Currently, little is known about the internal (intra-firm) behaviours that may positively affect collaborative marketing/logistics integration, or about the benefits that may be associated with making these considerable investments. In short, what should firms be doing to promote marketing/logistics collaborative integration? What is the potential payoff? This paper addresses these questions by examining relationships between the organisation's evaluation and reward system, cross-functional collaboration, effective marketing/logistics interdepartmental integration, and distribution service performance.</p>	INTEGRATED marketing/ INDUSTRIAL management/ SUPPLY chains/ INVENTORY control/ LOGISTICS/ MARKETING
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Frohlich, Markham T.//Westbrook, Roy	Demand chain management in manufacturing and services: web-based integration, drivers and performance.	Journal of Operations Management	2002	20	6	<p>This paper investigated the relationship between Internet-enabled supply chain integration strategies and performance in manufacturing and services. It summarizes the literature on demand and supply integration and describes four web-based strategies. A stratified random sample was collected from UK manufacturers and services, and there was strong evidence that demand chain management (DCM) led to the highest performance in manufacturing, but few signs of DCM in services. Manufacturers and services relying on only web-based demand or supply integration outperformed their low integration counterparts, but lagged DCM in manufacturing. The study also investigated DCM adoption drivers and found that rational efficiency and bandwagon effects drove change. The findings have some important implications for theory as well as for manufacturing and service companies interested in improving their performance.</p>	BUSINESS planning/ OPERATIONS research/ MANAGEMENT science/ SUPPLY & demand/ MANUFACTURING processes/ SUPPLY chains
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Heikkilä, Jussi	From supply to demand chain management: efficiency and customer satisfaction.		Journal of Operations Management	2002	20	6	<p>How do companies in the fast-growing industries achieve good customer satisfaction together with efficiency in supply chain management (SCM)? This inductive case study of six customer cases of Nokia Networks, one of the leading providers of mobile telecommunication technology, led to propositions exploring that question. Good relationship between the customer and the supplier contributes to reliable information flows, and reliable demand information flows in turn contribute to high efficiency--these are well-researched issues also in other industry environments. But in a fast-growing systems business such as mobile telecommunications industry, the supplier needs to be able to adapt its offering to a wide variety of customer situations and needs. Understanding the customer's situation and need together with the right offering contributes to good co-operation in improving the joint demand chain, which further leads to superior demand chain efficiency and high customer satisfaction.</p>	BUSINESS planning/ MOBILE communication systems/ MANAGEMENT/ science/ INDUSTRIAL procurement/ SUPPLY & demand/ SUPPLY chains/ INDUSTRIAL efficiency/ CONSUMER satisfaction/ NOKIA Networks Corp.
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Hines, Peter//Silvi, Riccardo//Bartohini, Monica					Journal of Operations Management		2002	20	6	<p>Recent reviews of the 'operations management' (OM) research literature have shown a surprising little shift towards empirical methodologies from traditional modelling solution methods. In addition, there is generally a lack of empirical testing and validation of manufacturing strategies. Coupled to this fact is that empirical work is rarely carried out in an inter-disciplinary manner, with the complete combination of OM, marketing, strategy, lean thinking and accounting approaches particularly poorly researched. Fully cross-functional integrative empirical research is required to help support the understanding of the applicability of OM practices within industry. This paper explores such an integration of approaches developed within the 'lean thinking, strategic cost management, marketing and policy deployment areas'. In order to investigate the approach a single automotive retailer is used as an instrumental case. The results of the study show that the new approach stands up well as an integrative approach that can prove highly beneficial results. However, the pilot work also identified a number of limitations that are the basis of further refinement and testing of the method.</p>	STRATEGIC planning/ MANAGEMENT science/ SUPPLY chains/ MANUFACTURING processes/ OPERATIONS research
Holmstro m, Jan//Lou hliuoto, Perttu//Vasara, Antti//Ho over,	The other end of the supply chain	McKinsey Quarterly	2000			1					DCM/ SCM

Jüttner, Uta//Baker, Susan//Christophher, Martin	Demand chain management--Integrating marketing and supply chain management	EMAC	2004				<p>This paper proposes demand chain management as a new model aimed at creating value in today's marketplace, which can combine the strengths of marketing and supply chain management. Demand chain design is based on a thorough market understanding and has to be organised in such a way as to effectively meet differing customer needs. The value system is proposed as the conceptual foundation of demand chain management and the roles of defining the level of differentiation and the roles of marketing are derived. By (1) defining the level of integration within the demand chain, (2) defining the level of differentiation and (3) adapting the demand chain to marketplace changes, marketing contributes to the creation of value within the value system and for the end customer.</p>	Demand Chain Management//Marketing and Supply Chain Management//Networks and Value Systems//Customer Value Creation
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Korhonen, Pertti//Huttunen, Kati//Eloranta, Eero	Demand chain management in a global enterprise-information management view	Production Planning & Control	1998	9	6	Investigates the strategy and role of Information Management as an assembler and contributor to successful business strategy. Use of Global Demand Chain Management; Differences between Supply Chain Management and Demand Chain Management; Outline of the key drivers and criteria for Information Management systems design. ABSTRACT FROM AUTHOR. The strategy and role of Information Management as an enabler and contributor to successful business strategy is discussed. Global Demand Chain Management is used as an example. Basic principles and differences of Supply Chain Management and Demand Chain Management are explained, focusing on the perspective of Information Management. Key drivers and criteria for Information Management system design are outlined. The gaps of current application software platforms are discussed.	INDUSTRIAL management/ BUSINESS planning/ DEMAND CHAIN MANAGEMENT/ SUPPLY CHAINS/ LOGISTICS /INFORMATION MANAGEMENT/ LOGISTICS INFORMATION SYSTEMS
Langabeer, Jim//Ros, Jeff	Is the supply chain still relevant?	Logistics Manager	2002		Mar		DCM/demand/SCM
Lee, Hau L.//Whang, Seungjin	Demand chain excellence: A tale of two retailers	Supply Chain Management Review	2001		Mar/Apr	Longs Drug Stores and Seven-Eleven Japan are proving that successful demand chain management can be a core competitive differentiator. Both have mastered the art of capturing and using information to respond to actual customer demands quickly and accurately. These leaders not only are operating at peak efficiency but also are posting profitability and value numbers that are the envy of the industry.	DCM

Lummus, Rhonda R./Vokurka, Robert J.	Managing the demand chain through managing the information flow: Capturing "moments of information"	Production & Inventory Management Journal		1999	40	1	<p>This article focuses on management of supply chain to create customer-oriented organisation and managing flow of information that enables all the linked member of the demand chain to better respond to changes in consumer demand. Part of managing the supply chain includes managing the flow of information between partners in the chain. Information on consumer purchases, sales forecasts, promotion activity on-hand inventory and production schedules is required to successfully manage the entire supply chain. Supply chain managers require information at all nodes of supply for all entities to be successful. Companies must consider all of the moments of information available to them. Firms are recognizing the importance of information in managing demand chains of the future. A company must implement plans to capture the information, determine how it will make it available to other supply chain partners, and decide how it will translate the information into improved business decisions. Key components of information planning are determining what information should be gathered and determining how critical time is to the usefulness of the information.</p>	INVENTORY control/ SUPPLY & demand/ INFORMATION resources management/ INDUSTRIAL procurement/ SUPPLY chains/ INDUSTRIAL management
Murphee, Julie	Building a customer-centered supply chain	Purchasing Today		1999		Jun		
SAP	The pathway to profit and competitive advantage			2003				DCM/ SCM

Vollmann, Thomas E.//Cordon, Carlos	Building successful customer--supplier alliances	Long Range Planning	1998	31	5	One of the most promising avenues for improving company competitiveness today is supply chain management, or more appropriately demand chain management. The difference in terminology reflects a radical change in the way many companies want to operate today who see the supply chain as primarily concerned with improved purchasing, usually through applying muscle power to the suppliers. Demand chain management starts with the customers, working backwards through the entire chain, to the suppliers of the suppliers. The objective is to create synergy in the overall chain to achieve larger benefits than are possible by each entity in the chain acting independently.	DCM/ Collaboration
Vollmann, Thomas E.//Cordon, Carlos//Jeikkilä, Jussi	Teaching supply chain management to business executives	Production & Operation Management	2000	9	1	By focusing on the management of entire value chains, supply chain management has gained practices can take companies to great heights; lack of attention can draw companies close to peril. In teaching supply chain management to business executives, there are four major issues that need to be highlighted: flawless execution of operation, the change from supply to demand focus, outsourcing, supply base development, and partnership implementation. This article explains these four issues, and the material that is developed at IMD to teach each of them.	SUPPLY CHAIN MANAGEMENT/ DEMAND CHAIN MANAGEMENT/ SOURCING/ PARTNERSHIPS
Vollmann, Thomas//Cordon, Carlos//Rababe, Hakon	From supply chain management to demand chain management	Perspectives for Managers	1995	9			DCM//SCM//Network//Business Relationship

Williams, Tim//Maull, Roger//Ellis, Bruce	Demand chain management theory: constraints and development from global aerospace supply webs.	Journal of Operations Management	2002	20	6	<p>This paper develops an empirical and theoretical approach to where strategic capabilities should lie within global aerospace supply chains. Theory from transaction cost economics (TCE) and the resource-based view (RBV) of the firm are applied to the aerospace sector and used to underpin a theory of demand chain management (DCM). A two-stage research process was used to generate and validate data from aerospace supply chain case studies. Demand chain driver and resource-based response categories were identified from these data and are presented. Concluding comments concern current limits of a demand chain theory and implications for practitioners.</p>	BUSINESS planning/ MANAGEMENT science/ OPERATIONS research/ TRANSACTION costs/ SUPPLY chains
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K. Descriptive Analysis Table for Collaboration

AUTHOR	TITLE	JOURNAL	DATE	VOL.	NO.	ABSTRACT	KEYWORDS
Abecassis, Celine//Cabry, Laurence	IT and coordination modes: The case of the garment industry in France and US.	Journal of Marketing Management	2000	16	5	<p>The aim of this article is to illuminate the relations between information technologies (IT) and modes of coordination among firms. Does IT strengthen existing partnerships, accentuate market volatility or facilitate integration strategies? Up to what point do the institutional environment and organisational forms favour the diffusion of IT or not? What may be said about the role of IT in the reorganisation of a supply chain? Through a study of the garment industry we will try to throw light on these subjects, presenting here some preliminary results of our investigations. We first explain previous research and then show the interest of studying the garment industry as a supply chain comparing the two supply chains in France and the United States. The transaction cost perspective will help us to explore how IT affects relationships between companies. In this context, the diffusion of electronic networks should be a major stake in rationalising inter-firm coordination modes. But we will see that this stake remains imperfectly strengthened: complex and rich social networks in some crucial stages of the supply chain offer a significant explanation.</p>	INFORMATION technology/ CLOTHING trade

<p>Akkermans, Henk//Bogerd, Paul//van Doremalen, Jan</p>	<p>Travel, transparency and trust: A case study of computer-supported collaborative supply chain planning in high-tech electronics.</p>	<p>European Journal of Operational Research</p>	<p>2004</p>	<p>153</p>	<p>2</p>	<p>Describes a case study of supply chain collaboration facilitated by a decision support environment in a high-tech electronics supply chain with multiple independent companies. In a business process called collaborative planning, representatives from these companies jointly take decisions regarding production and shipments for a large part of their collective supply chain. Particular attention is given to the interactions between levels of partner trust and information transparency on the one hand, and resulting improvements in supply chain performance on the other. The importance of hard work in developing the work flows necessary to support this joint planning process in starting a virtuous cycle of steadily increasing levels of all these aspects of supply chain collaboration is stressed. A theoretical model of the interactions between these aspects is presented, based upon a review in the literature. This model is then explored in an analysis of the collaborative planning case. Contains suggestions for further research and managerial recommendations.</p>	<p>INDUSTRIAL management/ HIGH technology industries/ BUSINESS planning/ BUSINESS logistics/ SUPPLY chains/ Supply chain management/ Collaborative planning/ Interorganisational trust/ Group decision-making/ Case study</p>
<p>Angeles, Rebecca//Nath, Ravi</p>	<p>Partner congruence in electronic data interchange (EDI)-enabled relationships</p>	<p>Journal of Business Logistics</p>	<p>2001</p>	<p>22</p>	<p>2</p>	<p>Business partnerships are a prerequisite for an effective supply chain. EDI-enabled business partnerships are crucial in linking suppliers and customers. This paper develops congruence factors for customer-supplier EDI partnerships. Data were collected from sixty-four customer-supplier dyads of firms using a questionnaire instrument. By factor analyzing thirty-one items, six congruence factors were identified: top-level strategic commitment, trading partner flexibility, joint partnering for EDI, readiness for high-level EDI implementation, EDI infrastructure, and partner communication. Additional analysis revealed that customer firms placed significantly more emphasis on congruence factors than supplier firms except for joint partnering for EDI. These findings have implications for assessing business partnerships in the networked economy.</p>	<p>Studies/ Electronic data interchange/ Logistics/ Supply chains/ Partnering/ Comparative analysis/ Performance evaluation/ Customer relations</p>

Attaran, Mohsen//Attaran, Sharmin		Collaborative computing technology: The hot new managing tool	Team Performance Management	Journal of Logistics Management	1999	10	8	01-Feb	2	<p>In a few years, the Internet has gone from being the communication tool of scientists to a primary route of information exchange for everyone from fashion designers to financial analysts. The Internet and its related services create an interactive working environment for users. Through the Internet, effective collaboration becomes possible whenever, wherever, and with whomever. Recently, there has been a significant growth in collaborative products and services aimed at small and mid-sized businesses. Discusses the evolution of the collaborative computing technology and addresses the capabilities of this new managing tool. Examines the trends in collaborative products and services and some of the collaborative computing products generating the most interest.</p> <p>Focuses on the application of virtual teaming in addressing agile supply chains. Function of information flows in the supply chain; Investigation on the structural changes of the automotive supply chain; Identification of geographic barriers to direct human interaction in the network.</p>	<p>Teamwork/ Project management/ Managers/ Video teleconferencing/ Supply chains/ Studies/ Internet</p> <p>BUSINESS enterprises/ INDUSTRIAL management</p>
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Chen, Injazz J./Paulraj, Antony	Towards a theory of supply chain management: the constructs and measurements.	Journal of Operations Management	2004	22	2	<p>Rising international cooperation, vertical disintegration, along with a focus on core activities have led to the notion that firms are links in a networked supply chain. This novel perspective has created the challenge of designing and managing a network of interdependent relationships developed and fostered through strategic collaboration. Although research interests in supply chain management (SCM) are growing, no research has been directed towards a systematic development of SCM instruments. This study identifies and consolidates various supply chain initiatives and factors to develop key SCM constructs conducive to advancing the field. To this end, we analyzed over 400 articles and synthesized the large, fragmented body of work dispersed across many disciplines. The result of this study, through successive stages of measurement analysis and refinement, is a set of reliable, valid, and unidimensional measurements that can be subsequently used in different contexts to refine or extend conceptualization and measurements or to test various theoretical models, paving the way for theory building in SCM.</p>	PRODUCTION management/ INDUSTRIAL procurement/ MARKETING -- Management/ SUPPLY chains/ INTERNATIONAL cooperation/ Supply chain management/ Constructs/ Instrument development
Claycomb, Cindy//Frankwick, Gary L.	A Contingency Perspective of Communication, Conflict Resolution and Buyer Search Effort	Journal of Supply Chain Management	2004	40	1	<p>This study investigates the moderating effects of buying context on the relationship between communication elements and the effort buyers exert while searching for new suppliers throughout a buyer-supplier relationship development process. A mail survey of members of the "Institute for Supply Management" was conducted and the data were analyzed using moderated regression. The results suggest that company size, buyer experience, relationship duration and relationship importance affect the association between a buyer's search effort and the communication elements. Interestingly, the buying context affects the relationship between search effort and the communication elements in different ways and to a different extent in each stage of the relationship development process.</p>	CONSUMER behavior/ SUPPLY chains/ BUSINESS communication/ SUPPLY & demand/ INDUSTRIAL procurement

<p>Golitic, Susan L./Davis F./McCa rthy, Teresa M./Ment zer, John</p>	<p>The Use of Electronic Data Interchange for Supply Chain Coordination in the Food Industry</p>	<p>Journal of Operations Management</p>	<p>2002</p>	<p>20</p>	<p>4</p>	<p>10</p>	<p>Supplier Management/ Purchasing/ Empirical Research/ Food Industry</p>	<p>PRESENTS information on a study which examined the impact of electronic commerce on managing relationships in the supply chain. Research methodology; Overview of electronic commerce environment; Conclusions.</p> <p>SUPPLY chain management (SCM) is concerned with the relationship between a company and its suppliers and customers. It is characterized by interorganisational coordination: companies working jointly with their customers and suppliers to integrate activities along the supply chain to effectively supply product to customers. More developed SCM is indicated by systematic integration, i.e. standardized and automatic interorganisational interfaces. Information technology (IT) engenders such systematic integration by allowing more efficient and automatic information now. This research focuses on electronic data interchange (EDI), an important class of IT used for interorganisational information transfers in the supply chain. Data from a survey of the food industry is used to examine the use of EDI with respect to interfirm coordination activities involving suppliers and customers. The influence of demographic characteristics on EDI use is also investigated. The results suggest that firms view EDI as a tool for improving efficiencies rather than as a tool for facilitating supply chain integration. There is also a surprising difference in firms use of EDI with customers vis-a- vis suppliers. Firms tend to be much more accommodating of the desires of their customers than of their suppliers.</p>	<p>ELECTRONIC commerce/ BUSINESS logistics</p>
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Larson, Paul D.//Kulchitsky, Jack D.	The use and impact of communication media in purchasing and supply	Journal of Supply Chain Management	2000	36	3	Effective communication is a critical component of buyer-supplier relationships. Purchasing professionals utilize a variety of media to communicate with suppliers, including phone, fax, face-to-face, mail, e-mail, Internet, and electronic data interchange (EDI). The purpose of this research was to assess the impact of EDI and a variety of other media on buyer supplier relationships and performance. Analysis of the responses from a survey revealed that EDI is not living up to its promise. The results also show that purchasing professionals' preference for various communication media depends on the nature of the message being transmitted.	Suppliers/ Alliances/ Electronic data interchange/ Polls & surveys/ Supply chains/ Corporate purchasing
Moberg, Christopher R.//Cutler, Bob D.//Gross, Andrew//Speh, Thomas W	Identifying antecedents of information exchange within supply chains	International Journal of Physical Distribution & Logistics Management	2002	32	9	Although information exchange among trading partners is consistently mentioned as a key requirement of successful supply chain management implementation, research on information exchange is scarce. This lack of research provides little guidance and support for those managers interested in improving their logistics operations through increased information exchange. The main goal of this paper is to identify potential antecedents of information exchange. Questionnaires were sent to logistics managers at manufacturing firms in several industries. The results of this exploratory study are detailed and the implications for logistics managers discussed.	Studies/ Supply chains/ Information sharing/ Logistics/ Corporate culture

Ovalle, Oscar Rubiano//Marquez, Adolfo Crespo		The effectiveness of using e-collaboration tools in the supply chain: an assessment study with system dynamics		Journal of Purchasing and Supply Management		2003		9		4		<p>Developments in information technology, in recent years, have enabled major advances in electronic commerce, which is growing at a very fast pace. Although business-to-consumer (B2C) e-commerce seems to be slowing down due to economic conditions, business-to-business (B2B) e-commerce still represents the next generation of business automation. Taking advantage of new technologies, today provides an opportunity, but will be a must in the future. The use of Internet e-collaboration tools will increase in this new era. They play a role of "value creation enabler", but at the same time they generate a wide range of new business and market "complexities" that companies have to face. This paper presents a classification of "managerial spaces" where multiple trading partners share critical information using e-collaboration tools and assess the possible local and global impact on the supply chain (SC) performance. This is made by means of a SC model conceptualization and a simulation study with system dynamics.</p>	
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Prahnski, Carol//Benton, W.C.		Supplier evaluations: communication strategies to improve supplier performance.		Journal of Operations Management		2004	22	1	<p>As firms increasingly emphasize cooperative relationships with critical suppliers, executives of buyer firms are using supplier evaluations to ensure that their performance objectives are met. Supplier evaluations, one type of supplier development program (SDP), are an attempt to meet current and future business needs by improving supplier performance and capabilities. The purpose of this study was to determine how suppliers perceive the buying firm GÇÖ's supplier evaluation communication process and its impact on suppliers GÇÖ performance. Three communication strategies (indirect influence strategy, formality and feedback) were tested separately and one in unison (collaborative). Using structural equation modelling (SEM) and data collected from 139 first-tier North American automotive suppliers, the results of this research have shown that, contrary to the SDP literature from the buying firm GÇÖ's perspective, the supplier GÇÖs perceptions of the buying firm GÇÖ's communication does not directly influence suppliers GÇÖ performance. Specifically, the supplier evaluation communication process does not ensure improved supplier performance unless the supplier is committed to the buying firm. Buying firms can influence the supplier GÇÖs commitment through increased efforts of cooperation and commitment. The results also indicate that when a buying firm utilizes collaborative communication, the supplier perceives a positive influence on the buyer - supplier relationship.</p>	<p>BUSINESS enterprises/ PURCHASING/ COMMUNICATION/ SUPPLY chains/ INDUSTRIAL procurement/ SUPPLIERS/ Supply chain management/ Supplier evaluations/ Supplier development/ Supply chain communication strategies</p>
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Rishel, Tracy D./Scott, J. Phillip//Stenger, Alan	A Preliminary Look at Using Satellite Communication for Collaboration in the Supply Chain.	Transportation Journal	2003	42	5	<p>The use of satellite communication systems in the motor carrier industry, has resulted in a variety of benefits for carriers, such as reduced costs and better asset utilization. This technology has also provided shippers the opportunity to keep track of inventory even while in-transit. In addition, shippers can share the data provided by their carriers' satellite communication systems with their customers in an effort to increase collaboration and coordination throughout the supply chain. Four shippers were interviewed regarding their view of satellite communications and the benefits that accrued to them when their carriers used this technology. All four shippers ranked the importance of their carriers having satellite communication capability as very high and cited customer service as the reason. The four shippers also realized benefits such as better customer service; information on shipment status; more timely data; and the ability to track the carrier, reorder stops, change the end destination, and monitor and measure carrier performance when their carriers used satellite communication technology.</p>	<p>Electronic data interchange (EDI), used traditionally to exchange business documents, has recently been extended to facilitate interorganisational collaborative processes such as the continuous replenishment program (CRP). The key characteristics of CRP are the sharing of real-time inventory data by retailers with manufacturers and continuous replenishment of retailer inventory by manufacturers. Prior research on EDI has focused on the transaction efficiency of EDI. We analyze the impact of information sharing and continuous replenishment in the CRP context and study the factors that affect the value of CRP. The study quantifies the value derived from CRP and the optimal number of retailers a manufacturer should partner with.</p> <p>Electronic Data Interchange/ Continuous Replenishment Program/ Supply Chain Partnerships/ Interorganisational Systems/ It Justification/ Electronic Data Interchange/ Supply Chain/ Information/ Technology</p> <p>ARTIFICIAL satellites in telecommunication/ TRANSPORTATION, Automotive/ SHIPPING/ SUPPLY chains/ CUSTOMER services/ TRANSPORTATION</p>
Raghuunathan, S./Yeh, A. B.	Beyond Edi: Impact of Continuous Replenishment Program (Crp) Between a Information Systems Research		2001	12	4		

Stefanson & Gunnar	Business-to-business data sharing: A source	International Journal of Production Economics	2002	75	01-Feb	<p>Supply chains/ Information technology/ Business to business commerce/ Logistics/ Information sharing/ Studies/ Electronic data interchange</p>
Skjoett-Larsen, Tage//Thornoe, Christian//Andersen, Claus	Supply chain collaboration: Theoretical perspectives and empirical evidence	International Journal of Physical Distribution & Logistics Management	2003	33	6	<p>Studies/ Forecasting/ Supply chains/ Production planning</p>
Shore, Barry//Venkatachalam, A. R.	Evaluating the information sharing capabilities of supply chain partners: A fuzzy logic	International Journal of Physical Distribution & Logistics Management	2003	33	9	<p>INDUSTRIAL procurement/ FOREIGN exchange rates/ SUPPLY chains/ INFORMATION resources management/ LOGIC, Symbolic & mathematical/ FUZZY logic</p>

Tang, Jeung-tai Eddie//S Daniel Y.//Tang, Tzung-I	A conceptua l model	Internatio nal Journal of Informati on	2001	21	1	Collaborative relationships in business markets are of growing importance to customers and suppliers alike. Customers need to decide whether to invest in a new supplier relationship, to maintain and develop a valued relationship, or to divest from a low-value relationship. Suppliers, in turn, face growing commoditization of products and seek to differentiate themselves through relationships. The measurement of value creation in buyer - seller relationships is still in its infancy, and a sound understanding of how firms create and deliver value in business relationships is needed. Emerging studies investigate relationship value based on dimensions derived from theory and lack a managerial perspective. Therefore, the present research explored relationship value from a grounded theory perspective. In-depth interviews with purchasing managers identified eight value drivers in manufacturer-supplier relationships. Implications for the measurement of the concept are discussed, and directions for further research are suggested.	Studies/ Electronic commerce/ Supply chains/ Interactive marketing/ Vendor supplier relations
Ullaga, Wolfgang	Capturing value creation in business relationships: A customer perspective.	Industrial Marketing Management	2003	32	8	INDUSTRIAL management/ EXECUTIVES/ RELATIONSHIP marketing/ SUPPLY chains/ Buyer-seller relationships/ Customer value/ Relationship value/ Grounded theory	
Vlosky, Richard P//Smith, Paul M	Enhancing business relationships via	Forest Products Journal	1993	43	5	Wood products/ Universal Product Code/ Studies/ Impacts/ Electronic data interchange/ Customer relations/ Bar codes/ Automatic identification	

