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**A grounded theory analysis of networking capabilities in
virtual organizing**

by

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Abstract

A grounded theory analysis of networking capabilities in virtual organizing

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The use of the Internet by web-based organizations impacts on all aspects of their business activities. The continuous evolution of e-commerce technologies enables web-based business (consisting of virtual supply chain partners) to integrate its manufacturing operations and to gain competitive advantage through entire virtual supply chains. Although the interplay of e-commerce and virtual supply chain cooperation is not clear when considering supply chain forecasting, planning, scheduling, execution and after-service, the potential for virtual coordination of business activities by means of e-commerce technologies is growing in importance.

In this regard, networking capabilities that enable virtual organizing activities in the virtual value chain network are of particular importance to web-based organizations. The research investigated this using a grounded theory approach.

The Grounded Theory analysis consisted of three phases. First, following a comprehensive review of the relevant literature, a set of particularly relevant articles was identified to provide the basic data from which to develop a first, preliminary framework or theory. This framework was subsequently refined to produce a concluding framework, using data collected during interviews with representatives of six different web-based businesses. Finally, the concluding framework or theory was validated by applying it to a particular case.

The concluding framework contains twelve networking capabilities, adding three to the nine identified in the preliminary framework. The conceptual



framework with theoretical description of relationships between identified networking capabilities clarify the use of networking capabilities with virtual organizing in a virtual value network of organizations.

An interpretation of the concluding framework, based on Actor-Network Theory, shows how the entrepreneur can leverage the inter-relationships between the networking capabilities to enable more effective and efficient virtual organizing. In particular, it shows how the entrepreneur can utilize knowledge and skills related to the identified networking capabilities to build and maintain a stable and eventually institutionalized network of partners. Finally, using the results of this interpretation of the grounded theory, the entrepreneurial process was defined in which the role of information technology as well as the role of the entrepreneur in establishing and maintaining the virtual value network was described.



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I declare that

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organizing**

is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

J F Koekemoer



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Chapter 1

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1.1 Introduction

The movement of globalization and the impact of changes in information and especially communications technology have forced important changes in the way entrepreneurial organizations participate in the global marketplace. The globalization of markets and strategies, and the increasing mobility of capital and entrepreneurial know-how drive the business and economic process worldwide. Various important aspects such as corporate outsourcing, globalization, the Internet and the Information Economy directly affect the way the entrepreneur is doing business today in the global marketplace.

The main advantage for the entrepreneur that can be attained from these developments is that distance is not a decisive factor for customers or partners in a value chain network. Another important organizational advantage for the entrepreneur is improved new organizational methods of coordination and cooperation in network type organizations.

Virtual networks are just one example of the new organizational models where information and communication technology act as the enabler. It is generally accepted (Archol and Kotler, 1999; Castells, 1996; Grewal *et al.*, 2004; Hamel, 2000) that among the characteristics and advantages that can be derived from this new information and communications technology-enabled organizational settings are:

- High flexibility in rapidly changing environments (the Internet world)
- Customer-focused business and service models
- Increased competitiveness.

While it might be expected that virtual organizations would deliver better input-output ratios than other organizational arrangements available in the global marketplace, it is not clear how organizations that implement virtual organizing could gain competitive advantage in the global marketplace.

What should be clear, however, is that the entrepreneur who implements virtual organizing should at the very least continuously support the development of value-adding competencies of all the participating value chain members if opportunities for competitive advantage were to be created. In order to do this, the entrepreneur has to understand how participating value chain members relate to each other and how the different networking capabilities would be combined. It seems therefore, that a need exists for a framework that explains how networking capabilities affect the way value chain members relate to each other when conducting coordination activities in the virtual network. In this thesis such a framework is presented (see Chapter 5) and has been developed using a Grounded Theory approach (see Chapters 3, 4 and 5).

The rest of Chapter 1 is structured as follows: First, in Section 1.2, the important concept of globalization and its impact on business thinking is explored. Second, in Section 1.3, the virtual organization, an inescapable consequence of globalization, is discussed. Against this background the problem issue is revisited in Section 1.4 where the research problem is formalized. The research study is motivated in Section 1.5, and Section 1.6 provides a road map to the thesis.

1.2 Important impacts of globalization on business thinking

At the beginning of the twenty-first century the term '*globalization*' has become a familiar concept within the international business community. This is understandable since globalization has similar impacts for the business world and on countries. Terms such as '*borderless world*', '*shrinking world*' and '*global village*' are often used to describe the increasing interdependencies between nation states, organizations and governments. Globalization implies a compression of the (physical) world of business that is facilitated by advances in technology and implies greater ease of cross-border transactions. At the same time, globalization also refers to an intensification of consciousness of the world (Robertson, 1992) where mass communications have the effect of breaking down

national borders or barriers. Globalization encourages greater awareness of and accessibility to competitors, suppliers, customers, financial institutions and consumers all over the world.

When considering international business the general consensus amongst researchers seems to be that internationalisation is constituted by a variety of transactions and exchanges that is carried out across national borders in order to satisfy the needs of individuals, customers and organizations (Rugman and Hodgetts, 1995). This wide and generic view of internationalization emphasises the importance of physical, information and technological exchanges and transactions occurring across borders in an international or global context. The central theme in international business, therefore, draws on Levitt's (1983) and Ohmae's (1989) theses that international firms can only survive by developing global strategies.

Several ways to further characterize the globalized world are discussed next. The new '*Knowledge Economy*' has been mooted by many authors (Kemp *et al.*, 2001; Hackney *et al.*, 2002; Jarvenpaa and Tanriverdi, 2002) as the way forward. Information technology, or perhaps more accurately Information and Communications Technology (ICT), is deeply implicated in globalization, and create a world of opportunities through e-commerce for the entrepreneur. These opportunities lead to new forms of organization in the business world, of which the so-called virtual network of organizations is discussed in detail in section 1.2.4.

1.2.1 The new '*Knowledge Economy*'

An important consideration in global management research today is how the transition of developing and developed nations to knowledge economies has resulted in an increasing awareness of '*knowledge*'; and the existence of knowledge networks (Hackney *et al.*, 2002), as a key lever for economic growth

and performance (Malhotra, 2000). Malhotra (2000) explains the way in which the emerging knowledge economy is characterized by industries that are more knowledge intensive, and by goods and products that are more intangible than they were in the post-industrial economy (Buchel and Raub, 2002; Zack, 1999; Larsson *et al.*, 1998). Very important to this new emerging knowledge economy is the concept of knowledge assets or intellectual capital that is considered to be the '*hidden*' assets of a country; and that supports its growth, fuels its growth and drives stakeholder value (Malhotra, 2000). Malhotra highlights the importance of knowledge management as '*the key driver of national wealth, the driver of innovation and learning as well as that of the country's gross domestic product (GDP)*'. This viewpoint on knowledge management seems to be a popular stance with researchers of information systems (Barnatt, 1996; Darling, 1996; Naisbitt, 1984).

There is also a very different school of thinking on the understanding of the term '*knowledge management*'. In fact, the term '*knowledge management*' and its supposed role in the knowledge economy are not recognized by all researchers in the field of information systems. It is essential to consider the use of the terms '*knowledge*', '*information*' and '*data*' and in what context it will be applied in the research. An understanding of the meaning of '*knowledge*', '*information*' and '*data*' impacts its general use in the literature when certain concepts are explained. It is also important to consider the general use of the term '*knowledge management*' as highlighted above.

The term '*knowledge*' can be defined as that what we know as individuals (Wilson, 2002). Wilson defines knowledge as '*the mental processes of comprehension, understanding and learning that go on in the mind and only in the mind, however much they involve interaction with the world outside the mind, and interaction with others*'. He explains that when the individual intends to express what he knows, he can only do so by uttering messages of one kind or another – oral, written, graphic, gestural and through '*body language*'. Wilson notes how such a message does not carry '*knowledge*' but constitutes '*information*'. The receiver may in a knowing mind assimilate, understand,

comprehend and incorporate the information into his own knowledge structures. It is important to consider that these structures are not identical for the person uttering the message and for the receiver. Wilson refers to Schutz (1967) in explaining how each person's knowledge structure is '*biographically determined*'. The conclusion is made that the knowledge built from a message can never be exactly the same as the knowledge base from which a message was uttered.

Data, if it consists of simple facts, can be explained as everything outside the mind that can be manipulated in any way. Information again consists of data that is embedded in a context of relevance to the recipient. The term '*information resource*' is considered to be collections of messages that are composed in various ways (Wilson, 2002). Wilson explains how various kinds of 'information resources' exist, such as collections of papers in a journal, e-mail messages in an electronic 'folder'; etc.

Wilson's main argument against the generally accepted understanding of the term '*knowledge management*' concludes that data may be managed but that knowledge (what we know) can never be managed except by the individual knower. He indicates that even then such a process is imperfectly executed and argues that we seem to have little control over '*what we know*'. This is because we often '*do not know what we know*'. That we know something may only emerge when we need to employ the knowledge to accomplish something (Wilson, 2002).

The author/researcher subscribes to the understanding of the term '*knowledge management*' as explained by Wilson (2002). All future discussions and use of the term '*knowledge management*' therefore indicate a personal management activity with the intent to manage the individual's own knowledge base. The term '*knowledge economy*' is also not recognized and instead we will refer to the '*information economy*' in all future discussions.

The next sub-section considers the impact of information technology in the global marketplace on all aspects of business activities.

1.2.2 The importance of information technology in the global e-marketplace

With all the ongoing changes that are taking place in the global marketplace the impact of information technology on business must be considered. It is important that the advances in information technology as well as the impact of globalization on the new information economy all be considered in relation to the potential that exists for the entrepreneur to participate in the global e-marketplace. Christiaanse *et al.* (2004) refer to Headrick (2000) in defining the e-marketplace as '*electronic networks where buyers and sellers meet to engage in buying and selling as well as other activities, such as collaborative planning, logistics, transportation arrangements and fulfilment-like the functions that traditional marketplaces have been fulfilling for thousands of years*'.

The information economy brought about new trends such as customer orientation and shorter life cycles of products that create ongoing new opportunities for organizations. It has also effected changes in the way global business is conducting its activities in the e-marketplace (Christiaanse and Kumar, 2000; Clemons *et al.*, 1993; Dai and Kauffman, 2001). These changes impact on both SME's and the traditional organizations forced to participate in the new e-marketplace to increase their marketshare. The need to implement virtual organizing therefore applies to any business organizational construct. One advantage of globalization relates to the creation of equality of global market conditions. The information economy enables organizations to improve their competitive capacity through the creation of virtual networks of partners, facilitated by advanced ICT. The business rationale for creating a virtual network of organizations is to enable adequate response to rapid change experienced in the e-marketplace (Hackney *et al.*, 2002).

Changes in the conditions in which businesses must participate in the e-marketplace happen at a faster rate than traditional hierarchical organizations can change themselves, thereby putting them at a disadvantage with

organizations participating as a virtual network of partners (Dyer and Singh, 1998). The virtual network of partners is able to quickly allocate the resources of its partners for new business cases as they arise in the e-marketplace (Barney, 1991). The traditional hierarchical organization structure is being replaced by businesses that consist of flatter, partnership-based, customer-focused and project oriented structures such as virtual value chain networks of small and medium enterprises (SME's) in the e-marketplace (Hackney *et al.*, 2002; Porter, 2001; Roebuck and Britt, 2002).

The never ending stream of new developments in information technology continuously brings about changes impacting the global marketplace. Some of the more important changes experienced in the global marketplace include increased customer expectations and a growth in competition (with regard to the market side). Franke and Hickmann (1999) highlight how participants in the global marketplace need to develop new value adding processes with information technology as the main enabler.

More needs to be said on how globalization has been greatly influenced by developments in information technology, especially communication technology. With globalization the ICT evolution is aggressively affecting the business world in the twenty-first century. The Internet is revolutionizing the role of ICT (Berendt, 1998; Olesen and Myers, 1999; Wang, 2000), with direct impact on the emergence of a global information society (Castells, 1996). The ICT evolution has established new concepts for human communication that affects economies and societies worldwide on an ongoing basis. It represents both a challenge and an opportunity to the developing world, where the Internet has the potential to be socially beneficial in issues such as economic growth, education, and business development (Allen *et al.* 2000; Ibbott and O'Keefe, 2004; Kamel and Hussein, 1999, Straub and Watson, 2001). The World Wide Web has also created exciting new opportunities for SME's to extend their customer base into the global marketplace (Von Biedermann, 2004; Grover and Saeed, 2004; Jin and Robey, 1999).

1.2.3 The opportunities e-commerce presents to the entrepreneur

Many factors contribute to the development of e-commerce which currently represents two percent of global business transactions but holds the promise of dominating the business environment in the course of the twenty-first century (Kamel and Hussein, 1999). Because of e-commerce, and the opportunities it presents, various new players (mostly small and medium sized organizations) have driven existing businesses to respond with their own web sites and the development of electronic channels.

In today's increasingly connected world it is difficult to imagine any industry ever returning to a form of competition in which traditional management structures can survive. Global competition in the twenty-first century will force every firm to become, at least to some extent, a network designer, operator and caretaker (Franke and Hickmann, 1999). E-commerce has created a culture of low cost/high efficiency products and services, which are dynamically available in the global marketplace in real time. All the changes recently experienced in e-commerce are only the beginning of more rapid changes to follow in the global marketplace of which the net or web-based organization and its business logic is an example. Various researchers (Christiaanse and Kumar, 2000; Davidow and Malone, 1992; Grover and Saeed, 2004; Hagel and Singer, 1999;) refer to virtual firms and electronic markets as examples of new models of organization and transaction governance. ICT not only is the enabler but also the driver of the firm's competitiveness in e-commerce. The creation of electronic networks enables web-based organizations to redesign their processes and business logic on a global scale (Tapscott, 1996). This issue is addressed in the next subsection and in more detail in section 1.3.

1.2.4 Virtual networks competing in e-commerce

An important aspect associated with SME's and their efforts to enter the global marketplace effectively lies in their potential to counteract the global mainstream of existing competitors and their efforts to create and defend their competitive advantage. SME's seem to have found a solution to improve their competitive capacity in the global marketplace through the web-based organization. Skyrme (2000) describes web-based organizations that implement virtual networks as the new way of organizing. According to Skyrme, such organizations display the following characteristics:

- Gain authority not from a hierarchy but from individuals (individuals considered to be persons or organizations), recognizing their knowledge and skills
- Link people and teams across conventional boundaries (e.g., departments, geographies and organizational frontiers)
- Have members and structures that can be adapted to changing circumstances
- Regard management as a sense of mutual responsibility and not as simply following orders
- Explore ways to work effectively versus following pre-defined processes;
- Readjust or disband teams as needed.

The potential of the web-based organization using a virtual network of partners in e-commerce is widely recognized (Burn and Barnett, 1999; Burn and Hackney, 2002; Caldeira and Ward, 2002; Christaanse and Kumar, 2000; Grover and Saeed, 2004; Gunasekaran *et al.*, 2004; Kumar and Dissel, 2001; Lee and Clark, 2001). The virtual network of partners represents an e-business model that can successfully compete in the e-marketplace.

One important consideration when considering web-based organizations relates to their role of introducing and promoting the creation of electronic networks of

different economic entrepreneurial entities (partners) (Christiaanse and Kumar, 2000; Clemons *et al.*, 1993; Hackney *et al.*, 2002; Von Biedermann, 2004) via the Internet. It is important at this point to consider the internal motivation or rationale behind the web-based organization. The motivation for the existence of the web-based organization as a business entity that develops electronic virtual networks of partners as the means to compete in e-commerce can be explained with the resource-based theory (Caldeira and Ward, 2003).

The web-based organization is intent on the creation of a competitive advantage in e-commerce with the assets and resources that is needed to create and deliver a competitive product or service in the global marketplace. This defines the need to develop electronic virtual networks as the means to create competitive advantage (Holland, 1995; Straub and Watson, 2001; Suomi, 2003; Soliman and Janz, 2003). Franke (2002) notes how the resource-based theory identifies the firm as a pool of resources, capabilities and competencies needed to accomplish a task, i.e., the provision of physical products or intangible services. The web-based organization consisting of a virtual network of partners, therefore, has emerged to create and develop flexibility and efficiency through better exploitation of resources and the development of capabilities within the virtual network of partners. A virtual network of partners offers the web-based organization the potential to create competitive advantage in the e-marketplace by utilizing the network and a resource-based approach in the way business is conducted.

According to Amit and Schoemaker (1993), resources are convertible, externally available and transferable, and owned or controlled by the firm. Capabilities, on the other hand, describe the information-based organizational processes that are firm specific, and that are often intermediate goods (Pitt and Clarke, 1999). In combination these resources and capabilities result in the strategic assets that form a base for sustainable strategic advantage for the web-based organization. Grant (1991) explains that resources and capabilities are the input to a transformation process. On its own, only a few resources and capabilities are productive. In order to be productive as a team of inputs in the web-based

organization the partners need cooperation and coordination (Franke, 2002). Franke explains that competencies relate to the capacity of a team with specific resources and capabilities to perform some task or activity. He relates competence to the capacity for combining and coordinating resources and capabilities in a way that leads to a desired outcome.

The ability of the web-based organization to accumulate resources varies. Since the firm's resource base has the ability to differentiate the firm from competitors, the basic idea with the resource-based approach is to manage the firm's resources efficiently in order to cultivate an emerging sustainable competitive advantage. The strength of the networked firm's resource base can be characterised by two main features: the amount and the quality of the resources. The amount of the resources is the sum of existing resources within the firm and the availability of external resources, whereas the quality of the resources can be characterised by special features, such as heterogeneity and compatibility of the resources. Through networking the web-based organization is therefore able to connect to a wide range of resources and overcome the lack of own resources, but this connection is limited because of the speciality of the resources.

The web-based organization therefore creates a competitive advantage by combining the different available resources of different independent companies in an electronic network setting. It is also important to consider the role of a specialization strategy for the web-based organization that implements a virtual network. The specialization strategy calls for the web-based organization to increase its own level of specialization by means of cultivating specific skills and outsourcing or 'downsizing' peripheral activities. The idea of downsizing in this instance is to focus on the competitive edge of the web-based and to eliminate the rest (Quinn *et al.*, 1990). The specialization strategy assumes that the external resources are easily applicable to the web-based organization's electronic processes. Thus, considering the prerequisites of the specialization strategy, the firm that intends to become a member of the web-based organization's virtual value chain network needs to be aware of the complementarity and transferability of its core resources. Ideally a participating

organization's resource base should be strong, implying that the firm has a wealth of resources that are highly specialized and transferable.

Web-based organizations that function as virtual networks enabled by ICT gained a competitive advantage in the global marketplace since it allows members of the value chain to concentrate on their own core competencies (Franke, 2002). What is needed at this time, is to argue how the concentration on core competencies of the members in the value chain enables them to overcome the constraints of time and space. This is the first step towards the virtual organization, which is discussed next.

1.3 Virtual organizations and virtual organizing

The previous discussion highlighted the role of the web-based organization to create competitive advantage through electronic virtual networks in the global marketplace. It is important to consider the difference between virtual organization and the network organization, if any. Archol and Kotler (1999) define the network organization as follows: “ *A network organization is an interdependent coalition of task or skills specialized economic entities (independent firms or autonomous organizational units) that operates without hierarchical control but is embedded, by dense lateral connections, mutuality, and reciprocity, in a shared value system that defines “membership” roles and responsibilities.* “ Katzy and Horodyskiy (2002) acknowledge that many authors do not differentiate between the virtual organization and a network organization. Jagers *et al.* (1998) point out that “*every virtual organization is a network organization, but not every network organization is a virtual organization*”. More authors define a virtual organization as a specific kind of network. Electronic networks of companies operate vastly different from the more traditional network organizations. Katzy and Horodyskiy (2002) differentiate between virtual and network organizations based on the behaviour of the organization. This

distinction is made based on the research of Walker *et al.* (1997) who indicated that the network organization tends to be stable and resistant to change.

For purposes of the discussion it is important to define the term '*virtual organization*'. This is in order to reach a conclusion regarding the correct understanding and use of the concept '*virtual organization*' in later discussions.

When considering the meaning of the term '*virtual*', Hedberg *et al.* (1997) indicate that using either the term '*virtual*' or '*imaginary*' is but a personal matter. They go on to explain "*Martin (1996) refers to degrees of virtualness in business firms, and we find the perspective of imaginary organizations useful in enterprises which are less or more imaginary. While 'virtual' to our taste, takes us to the world of technologies, 'imaginary' carries more flavours from the world of humanities*". Although the author of this research work has chosen to accept the collective concepts of imaginary systems and the imaginary organization, the term '*virtual organization*' will be used throughout the thesis since it is more widely accepted in the literature. The meaning attached to the term '*imaginary organization*' is of considerable value in understanding the role of the entrepreneur and will be discussed in some detail in Chapter two.

The following definition highlights important aspects pertaining to the virtual organization. Byrne *et al.* (1993) describe the virtual organization as follows:

"A virtual corporation is a temporary network of independent companies – suppliers, customers, and even rivals – linked by information technology to share skills, costs, and access to one another's markets. This corporate model is fluid and flexible; and consists of a group of collaborators that quickly unite to exploit a specific opportunity. Once the opportunity is met, the venture will, more often than not, disband. In the concept's purest form, each company that links up with others to create a virtual corporation contributes only what it regards as its core competencies. Technology plays a central role in the development of the virtual corporation. Teams of people in different companies work together, concurrently rather than sequentially, via computer networks in real time" (Byrne *et al.*, 1993, pp. 36-37).

This definition clearly highlights the distinctive role of information technology as the enabler of the virtual organization. It is furthermore clear from the definition that the virtual organization should rather be considered as a '*project based organization*' that allows for '*an organizing process, rather than a rationally structured organization*' (Staber, 2004). It is important to note that virtual organizing is not the exclusive domain of web-based businesses but is indeed also used by so-called 'click and brick' businesses that participate in electronic markets (Elliot, 2006).

It is clarifying to consider the functions associated with a 'virtual firm'. Such functions refer to the means of coordinating or organizing (Bryson and Rusten, 2004). Bryson and Rusten explain how '*this draws attention to the process or function or organization rather than the form within which the process is embedded – process is more important than form*'. By defining the term '*virtual organizing*' as a strategic approach, focused on creating, nurturing and deploying intellectual and knowledge assets while sourcing physical assets in a complex network of relationships, the virtual organization is described as a process. When adopting the process perspective, it is understood that web-based organizations establish electronic networks by means of virtual organizing in order to exploit the opportunities that exists in e-commerce. The most important aim with virtual organizing is to create and to continuously develop cooperation and efficiencies in the business processes of the web-based virtual network in the global marketplace.

In conclusion, our theoretical conceptualization of the web-based organization consisting of a virtual network of partners emphasizes the function of virtual organizing and the continual process of becoming (Bryson and Rusten, 2004). In this research, virtual organizations are considered as a management principle rather than a definite form of organization. In all discussions the term '*virtual network*' will be used when referring to the web-based organization that implements a virtual network of partners in the e-marketplace.

1.4 Motivation for this study

The virtual network has largely grown out of the outsourcing strategy (as mentioned in Section 1.2.4) and vast new opportunities that emerged along with the development of information technology. Andren, L. & Sjolander, S. (2002) identify a shortcoming of the resource-based perspective in relation to the issue of external dependence as the need to maintain a strong focus on the identification and development of internal resources and capabilities. The virtual network of partners needs to consider what assets to develop inside the firm and what to access externally on a continual basis (Teece, 1998). Virtual networks therefore attempt to combine the network approach and the resource-based strategy in order to uncover possible sources of competitive advantage (Foss, 1999). Since ICT enables and brings about the need for the transformation of processes with regard to resource contribution in a virtual network of organizations, it implicates the importance of network capabilities as the capacity to perform virtual organizing activities. Foss points out that sustainable competitive advantage can be created as a result of a number of interaction effects enabled through networking capabilities in a virtual network of partners. This, as far as could be ascertained, has not yet been researched in detail. This study aims to develop a realistic framework of networking capabilities and their interrelationships that could enhance the understanding of how effective and efficient virtual organizing could be enabled in a virtual network of partners.

Lorenzone and Lipparini (1999) consider the capability of a virtual network to interact with other members of the value chain to be a distinctive organizational skill pertaining to individuals. In such an environment, it becomes critically important for the virtual network to identify and exploit needed networking capabilities that facilitate and optimize virtual values in the e-business value chain. Pihkala *et al.* (1999) describe the need for networking capabilities as follows:

“... Highly specialized and transferable resources are valuable for a networking firm, but cannot be put into full use without the capability of networking. The nature of networking capability as an action-based capacity of an individual entrepreneur or an organization to extra-organizational activities may result in self-incurring tendencies: that is, those without [sic] adequate level of networking capability do not attempt to be included in networking, while those high in networking capability increase their commitment in networking due to their prior positive experiences”.

The idea for this study came mainly from this paper by Pihkala *et al.*(1999). It can be concluded from this paper that particular networking capabilities may or may not contribute to the effectiveness of other networking capabilities implemented in the virtual network of organizations, thereby indicating the need for a framework that explains interrelationships between the identified networking capabilities.

In essence, the possession and development of networking capabilities concern the ability to ‘*network*’ which has a direct link with entrepreneurship. A virtual network with well developed networking capabilities has superior competencies to create effective and efficient electronic networks with participating value chain members. A seemingly low capability for networking suggests that an organizational skill (of networking) has not developed in the virtual network to the same measure as in networking-intensive organizations (Pihkala *et al.*, 1999). Thus a business opportunity (an idea) can materialize into a network-oriented virtual network of partners where excellent networking capabilities are developed or exist. These networking capabilities of the virtual network are considered to be an organizational as well as an entrepreneurial characteristic. This emergence of intensive co-operation and the act of electronic network development is a natural consequence of a mutual need to develop virtual networks by connecting separate but compatible parts in e-commerce. It is important to note that networking capabilities not only pertain to value chain members but also to customers in e-commerce. This study explores these networking capabilities in a virtual network of partners. A better understanding of networking capabilities and its implementation in virtual networks of companies presents the opportunity to

gain more insight into the underlying forces responsible for virtual organizing activities.

The entrepreneur and partners of a virtual network use networking capabilities with virtual organizing activities in the e-marketplace of users. Web-based businesses that implement a virtual network of partners need a better understanding of how networking capabilities enable virtual organizing in the virtual network. This research will attempt to develop a conceptual framework that explains the possible role of networking capabilities in virtual organizing in the web-based virtual network of value chain partners. The conceptual framework firstly explores and identifies these networking capabilities. The framework then explains how the networking capabilities interact to motivate and to enable the implementation of virtual organizing activities in a virtual network of companies.

The introduction of an integrated framework provides the entrepreneur with some overall direction on how the relational networking activities performed by the individual members of the value network also contribute to the vision of the entrepreneur for the virtual network. Such a framework sheds more light on how the entrepreneur could secure action of its value chain members needed to realize the vision for the virtual network of partners. It might also shed some light on other related aspects pertaining to how networking capabilities might support the entrepreneur in preventing other members from setting up their own virtual network and '*stealing*' the vision of the entrepreneur for his e-business.

The primary motivation for and aim of this study, then, is to develop such a framework that focuses on networking capabilities, their inter-relationships and how they enable virtual organizing activities in a virtual network of partners. The research therefore seeks to clarify the existence of networking capabilities as preconditions that affect the abilities of web-based organizations with a virtual network of partners to effectively conduct virtual organizing.

The next section provides the problem statement of the thesis.

1.5 Problem statement

Virtual organizing enables the entrepreneur to electronically interconnect with his customers in e-commerce as well as with the virtual network of partners that is required to distribute resources as well as products and services across previous physical divides. Franke and Hickmann (1999) highlight how ICT enables economic actors to reorganize the value adding process, with regard to the organization side, in response to the market side. Virtual organizing therefore facilitates and coordinates the value creation and delivery processes in the e-marketplace. Virtual organizing is conducted by means of coordinating activities that support effective and efficient working relationships in the virtual network of partners. Since it is not possible to control a virtual network of partners, in contrast to hierarchically structured organizations, the entrepreneur is dependent on specific networking capabilities that enable effective and efficient virtual organizing in the virtual network of organizations. Networking capabilities relate to the capacity of the entrepreneur and other members of the virtual network of partners to effectively and efficiently conduct virtual organizing activities. The main problem that the entrepreneur needs to address in a virtual network is:

Given that the absence of control over the virtual network of partners needs to be substituted with virtual coordination activities in order to reach the objectives of the virtual network, what networking skills are required to enable such virtual organizing?.

The basic research problem could thus be formulated as follows:

To develop a framework of needed networking capabilities and their inter-relationships that enable successful virtual organizing in e-business.

This approach to the problem of virtual organizing as a substitute in the absence of control over a virtual network of partners should result in a better understanding of what enables effective and efficient virtual organizing. We consider networking capabilities not only to define a needed skill but also to

describe an underlying motivation for specific coordination activities. This can be illustrated by means of an example. The entrepreneur might recognize the need to enhance trust formation in the virtual network of partners as the motivation for steps to be taken. The entrepreneur will then consider implementing additional and specific coordination activities in order to enhance trust formation in the virtual network. This need might also be addressed by means of other coordination activities and by the way other network coordination activities are conducted in the virtual network, thereby promoting the formation of trust between virtual partners.

The example indicates how related networking skills not only can be applied with coordination activities within the virtual network, but also facilitates the recognition of needs to be addressed in the virtual network. Coordination activities can therefore be implemented for diverse purposes that not only impact on a specific need that exists in the virtual network but might be motivated by other needs, identified and enabled through various and diverse networking capabilities. ICT enabled virtual organizing calls for entrepreneurs to develop social networking skills along with technical network skills needed to manage the coordination activities associated with virtual organizing. Networking capabilities enable the virtual network of value chain partners in all relevant processes that integrate, reconfigure, gain and release resources in the network.

Based on the above description of the research focus, it is possible to construct research questions that typically inquire about the ontological, phenomenological, epistemological and normative nature of the problem or issue at hand (Roode, 1993). Led by these considerations the following basic research questions have been identified:

- What are the networking capabilities that enable virtual organizing in a virtual network of organizations?
- How does the web-based organization approach the issue of obtaining and enabling networking capabilities in the virtual network?

- Why is the concept of networking capabilities so important in virtual networks of organizations?
- How should web-based organizations approach the issue of obtaining and managing networking capabilities in virtual networks of organizations?

The next section provides a road map to the thesis, explaining the overall structure of the thesis.

1.6 A road map of the thesis

The broad context for the research and a discussion of the research problem in this context are presented in Chapter 1. Next, an overview of relevant literature is given in Chapter 2. This enabled the research objective to be formulated in Chapter 3. This chapter also addresses aspects pertaining to the research objective and research approach, and presents a detailed discussion of the research methodology. The application of the research methodology in pursuit of the research objective is conducted in Chapters 4 and 5. Finally, the major findings, conclusions and an assessment of the research results are given in Chapter 6 and 7. An overview of the structure of the thesis is given in Figure 1.1.

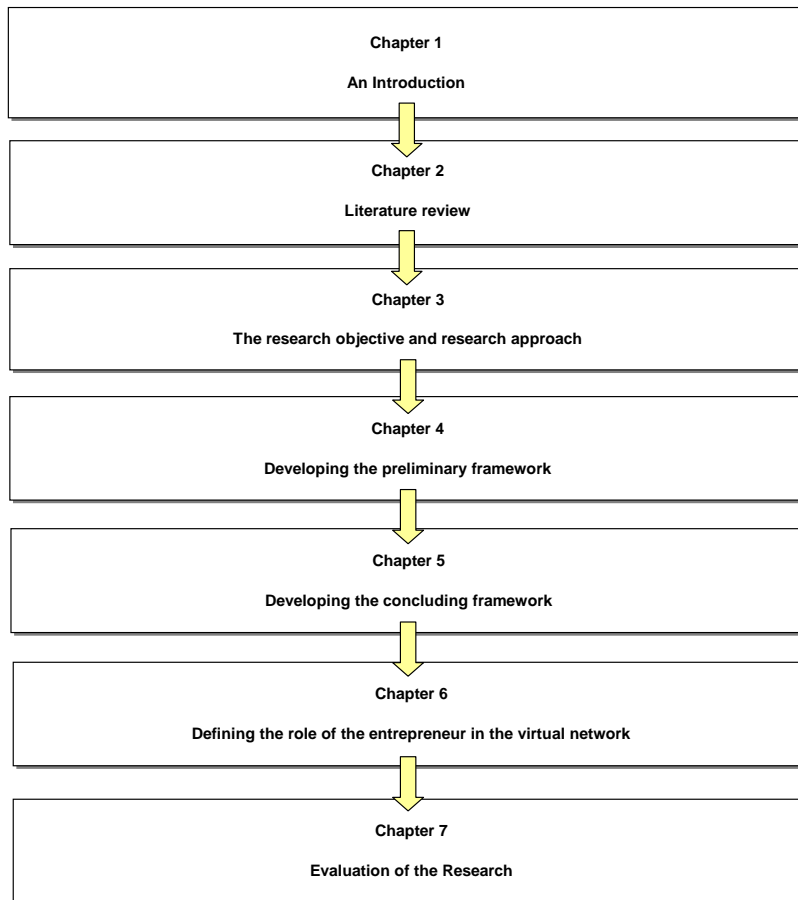


Figure 1.1 A road map of the thesis

1.7 Chapter summary

The new economy is global, high-tech, fast-cycle and networked through e-commerce. Electronic networks using virtual organizing are shaping the competitive performance of small firms in the global information economy. It is clear that soft assets and strategies will determine the real winners. Successful web-based small and medium enterprises will be those with the distinctive skills to manage the unique features of both the electronic marketplace and the enabling infrastructures. This research investigates a topic that is of interest to

entrepreneurs and managers of virtual supply networks and also to firms seeking to be included in virtual networks and will be guided by the following research aim: To develop a framework of needed networking capabilities and their inter-relationships that enable successful virtual organizing in e-business.

Chapter 2

The literature review

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2.1 Introduction

In this chapter an overview is given of aspects pertaining to virtual networks and the implementation of virtual organizing (with a virtual network of partners) as the means to participate in the e-marketplace. It is only appropriate to define the organization at this early stage of the discussion. Many definitions of organizations exist in the literature but for the purposes of this discussion the organization will be defined as:

“The organization is composed of people and groups of people in order to achieve some shared purpose through a division of labour integrated by information-based decision processes that continues through time”
(Galbraith, 1977, p.3)

The various interpretations by different authors of the term ‘virtual organization’ are also discussed in this chapter. This central role of networking capabilities in coordinating virtual activities is highlighted and some theoretical and philosophical background is provided on aspects of virtual coordination activities of the entrepreneur leading to effective virtual organizing.

The chapter is divided into four sections. First, the history of organizational constructs and their development is discussed. The next section considers important concepts including virtual coordination, competency as well as the resource-based theory, virtual value chain networks and how they relate to e-commerce. Third, the role of the entrepreneur with regard to critically important aspects such as information management, trust formation and value creation is discussed. Section four provides a critical review of the relevance of network capabilities for supporting the entrepreneur in virtual organizing. Finally, some conclusions are provided.

Chapter Two covers a broad spectrum of relevant issues and topics as outlined above. It is to be expected that such a broad and holistic approach to the issue

unfortunately means that Chapter Two needs to cover a large amount of different and lengthy concerns.

2.2 Theoretical perspectives of organizational constructs

Globalization not only influences the way business is conducted but impacts on the type of organizational constructs adopted by small and medium- sized organizations (SME's) in the global marketplace. SME's participating in the global marketplace are therefore forced to respond to the increasing competitive global business environment by implementing new forms of organizational structures to improve their competitiveness. Section two begins with a conventional review of recent literature on organizational development, organizing the literature around widely accepted research aspects pertaining to hierarchical structures and pointing to current developments in hierarchical as well as network organization constructs. Due to the rapid increase in network organizational research in management we will review and classify related aspects pertaining to existing network structures and what is being done in the area with regards to new concepts such as virtual organizations.

The purpose of this section is to evaluate the differences between traditional hierarchies and network organizations. We also discuss various interpretations of what constitutes the virtual organization and draw some conclusions regarding virtual organizations. The discussion in this section concludes with an analysis of how virtual organizations can be implemented successfully in the global marketplace by SME's participating as web-based business entities.

2.2.1. Defining the various organizational constructs

The earlier organizational evolution differentiates four broad forms of organizational constructs, namely, functional, divisional, matrix and network. The main issue with the application of various organizational forms is what impact on each type's success. Miles and Snow (1992) consider market and technological changes to be two important considerations that impacts on the effectiveness of a particular organizational form. Various researchers recognize how an organizational form only seems to perform optimally within certain limits (Miles and Snow, 1992; Lucas and Baroudi, 1994). Each of the recognized organizational forms can be linked to specific strengths and weaknesses. The following discussion highlights more important aspects regarding the logic of each form of the hierarchical construct, which follows the discussion of Miles and Snow (1992).

a. The Functional form

This organizational form allows for specialization that is centrally coordinated. Firms would integrate forward and backward in an attempt to secure the efficient sale of their products and services (forward) as well as reliable movement of needed input to secure efficient operation (backward). The more important cause of failure of the functional form can be traced to the fact that it does not easily adapt to product or service diversity.

b. The Divisional form

The divisional form of organization allows for divisional autonomy that is linked to centrally based control. The division therefore does not get to evaluate its own performance while resource allocation in the company is conducted separately. The divisional form reacts faster to new opportunities and saves on the cost of reacting to new market opportunities. Miles and Snow (1992) indicate that '*the divisional form achieves both flexibility and*

economies of scale by its ability to rapidly focus clusters of assets on new or expanding markets'.

c. The Matrix form

The operating logic of the stable portion of the matrix form is similar to that of the functional form, namely, centrally coordinated specialization. That section of the matrix form that responds to unique or changeable markets emphasizes local operating autonomy that is similar to the divisional form. Miles and Snow indicate that with the matrix form a firm should be careful not to extend its operations '*beyond the capability of its structure*'.

Hierarchically structured organizations came into being with the industrial revolution with its emphasis on supply-side controlled markets. Hierarchically structured organizations would attempt to gain cost-advantages with economies of scale which used to be created with the emphasis on their production lines. Each of the above discussed hierarchical organizational forms give optimal results but only as long as their operating logic is not violated (Miles and Snow, 1992). Presently companies still implement hierarchical structures with a great amount of success although it must be said that co-operation and connections with independent companies have always been present, or as Hakansson and Snehota (1995) points out: "*No business is an island*". Firms with a hierarchical organizational construct adopt elements of the network organizational structure in order to compensate for deficiencies of a structural nature.

The network organizational structure is more effective and supports important aspects such as relations and cooperation between independent businesses (Lucas and Baroudi, 1994). Moller *et al.* (2005) refer to Axelsson and Easton (1992) when distinguishing between a '*network of organizations*' and a '*network organization*'. Moller *et al.* (2005) highlight that according to the Industrial Network Approach (INA), any market can be described as a kind of macro network, or a '*network of firms*'. Achrol (1997) again stresses the density, multiplicity and the reciprocity of ties and the shared value-system that define

membership roles and responsibilities as a means to identify the '*network organization*'.

The deficiencies of the functional, divisional and matrix organization structures have led businesses to consider the network organization structure as an alternative that is capable of overcoming the problems experienced with the hierarchical organizational structure (Hinterhuber, 2002). Miles and Snow (1992) identified three variations of the network type of organization that organizations need to consider, namely, the stable, the internal and dynamic network. The operating logic associated with each variation needs to be well understood in instances where managers attempt alterations to the basic network form (Miles and Snow, 1992).

The following discussion highlights the more important aspects regarding the logic of each form of the network organizational construct, which again follows the discussion of Miles and Snow (1992).

A The Stable Network

The stable network can be related to the functional organization with relation to its structure and operating logic. The stable network integrates firms with independently owned specialized assets along a given product or service value chain. Miles and Snow (1992) explain how '*the stable network substitutes a set of component firms, each tied closely to a core firm by contractual arrangements, but each maintaining a competitive fitness by serving firms outside the network*'.

B The Internal network

The internal network creates a market that exists within the firm. Units within the organization trade goods and services amongst themselves at prices that are market related. Units also do business outside the network in the open market. The main advantage with the internal network is the exchange of managerial and technical know-how. This type of network gains competitive advantage through shared utilization of scarce assets.

C The Dynamic network

The dynamic network links independent firms together for the once-off production of a particular good or service. The dynamic network achieves its full potential when various partnering firms participate in the virtual value chain. Any of these firms must be ready to be pulled together for a '*project*' to be released to another '*project*'.

The internal network relates to the internal coordination of a firm while the stable network allows for external coordination and the dynamic network is a short-term network implemented for once-off projects or single products. The definitions of the types of networks are not very clear (Belussi and Arcangeli, 1998) and management researchers have since identified a fourth type of network. This development impacts on the other three types of networks where different terms and interpretations seems to be attached to each one and will be discussed in more detail in sub-section 2.2.2.

It is important to consider the applicability of a specific organizational construct to the needs of a specific business active in the global marketplace. Miles and Snow (1992) acknowledge that '*if managers understand the logic of the form their organization implements, and if they keep that logic visible to themselves and others associated with the organization, the benefits of proposed changes can be weighted against the strains they impose on the total system*'. Miles and Snow continue and suggest that '*if managers understand the operating logic of alternative forms, they can explore the possibility that environmental changes have pushed their organization outside the boundaries of one form and into those of another*'.

Any firm that implements a web-based organization with the aim to participate in e-commerce will need to consider at least some form of network organizational structure. Firms tend to opt for the network organizational structure when its functioning requires complementarities, ongoing relationships, and reciprocity between a core firm and its network partners (Ching *et al.* 1996). They indicate that the participating partner firms in a network configuration are more flexible in

their operational functioning with regard to possible central administrative control. This is in contrast to relationships between participants in a firm with a hierarchic organization structure that tends to be fixed and inflexible. Participating firms in a network tend to complement each other's strengths. Firms that participate in a network configuration have a tendency and commitment to establish and cultivate ongoing relationships while in the open market prices tends to be the principle means of coordination (Ching *et al.*, 1996).

The above discussion highlights the difference between the network and the traditional hierarchical type of organization. The next sub-section considers the relevance of the network organizational construct and its applicability to the way international firms conduct their business.

2.2.2 The network organizational construct and its application in the global marketplace

Knowledge and technology have an impact on the way business is conducted and on organizational constructs. The networking of the economy forced firms active in the global marketplace to redesign their organizations structures (Belussi and Garibaldo, 1996). Ojasalo (2002) refers to Moller & Wilson (1995) when mentioning that the term "*network*" refers to relationships between various firms that interact with each other. Achrol and Kotler (1999) identify four types of networks, namely internal, vertical, intermarket and opportunity networks. Hinterhuber and Levin (1994) also identified four different types of networks with very similar descriptions to that of Achrol and Kotler (1999) namely, internal, vertical, horizontal and diagonal networks. The four variations to the network construct as identified by Hinterhuber and Levin (1994) differ in their application within organizations. Firms which implement internal networks aim to reduce the level of hierarchy and to be more open to their environments. Firms which implement the vertical network structure tend to maximize the productivity of

serially dependent functions by means of partnerships with interdependent skill-specialized firms. Intermarket networks enable and leverage horizontal synergies across various industries as needed. Firms which implement opportunity structured networks organize their activities around customer needs and existing market opportunities (Ojasalo, 2003). Each variation of the network organizational construct is applicable to a different set of needs and the firm needs to consider this when making the decision to implement a specific type.

When considering organizational constructs in international business and how organizational constructs have evolved over time, the movement towards virtual strategic networks can be explained. Hinterhuber and Levin (1994) indicate that the organizational construct typical of international businesses developed from '*uncontrolled chaos*' into conglomerates and then into focused business units. This process continued with the reorganization of enterprises into a collection of units where each one contributes core competencies, thereby creating a network of strategically structured networks. Figure 2.1 indicates how company networks can be analysed in terms of capital (equity) and operational (strategy) linkages in their evolution to strategic networks.

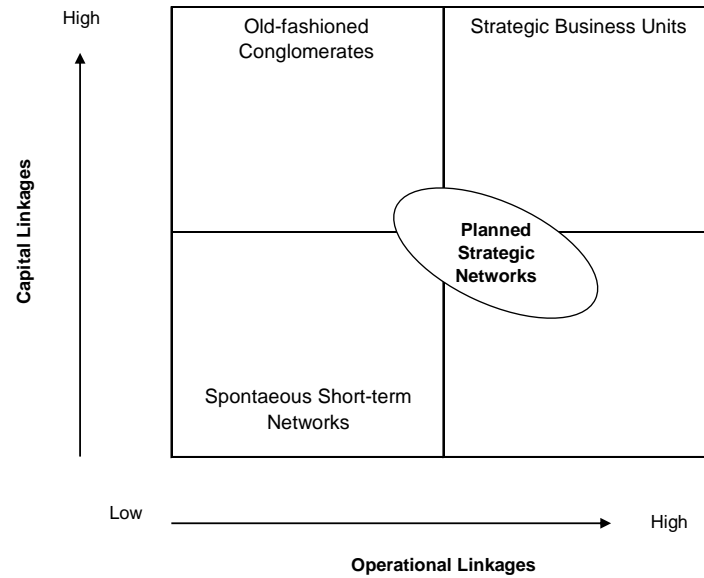


Figure 2.1 Company networks development
(Source: Hinterhuber and Levin, 1994)

Amit and Zott (2001) refer to Geluti and Garino (2000) in stating that strategic networks are ‘*stable interorganizational ties, which are strategically important to participating firms*’. Transnational enterprises started to implement strategic networks in the early nineties. Hinterhuber and Levin (1994) explain the advantages that can be obtained from strategic networks with elements related to corporate ownership and operating control. We consider strategic networks for purposes of this discussion to consist of at least three actors active in an intentionally formed network in order to exploit a business innovation or idea. The evolution of the organizational construct as described by Hinterhuber and Levin (1994), alluded to before, is illustrated in Figure 2.2.

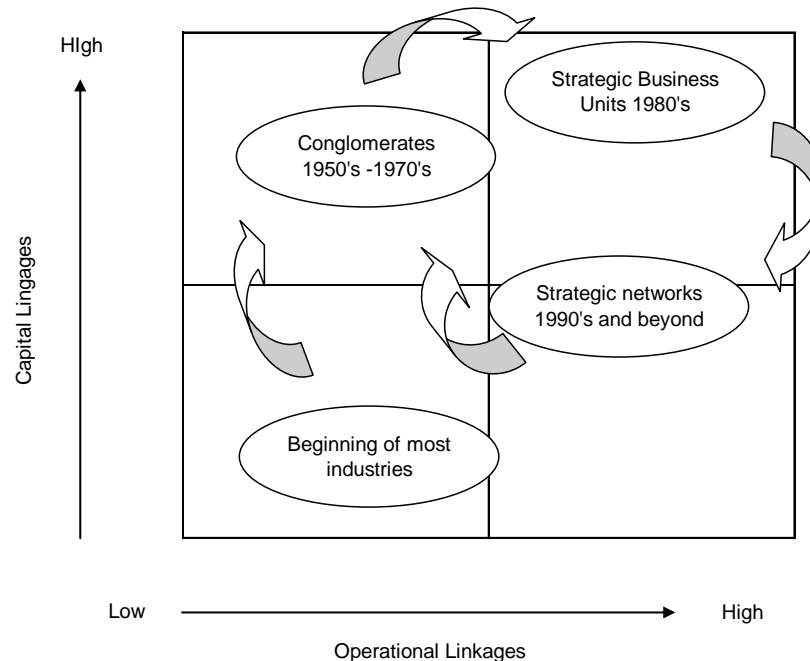


Figure 2.2 Evolution of organizational construct
(Adapted from Hinterhuber and Levin, 1994)

Figure 2.2 implies that strategic networks should not be considered as the only solution by companies operating in a particular industry. The applicability of the strategic network in a particular setting relates to the need for a certain degree of operational linkages in relation to a needed degree of capital or equity bonds between firms participating in the strategic network. The evolution of the industries started with many industries operating as small firms in a specific segment to exploit a specific need in the marketplace. Such small firms normally do not have a capital linkage and functions in an *'unplanned network'*. In the next phase firms tend to compete more aggressively and the 'shake-up' occurs. In this phase the firms reach a maximum size and while faced with maturing markets, the firms create conglomerates in order to manage their cyclical business segment by diversifying in order to minimize risk. This scenario was a regular event in the 1960's. Hinterhuber and Levin (1994) note how business theoreticians insisted that shareholders should take responsibility for earning

diversification and with the many corporate takeovers occurring in the 1970's and 1980's companies started opting for strategic business units (SBU's) instead. Centralized SBU's had a high degree of operational freedom that enabled management buyouts and the creation of completely independent firms in the eighties. The nineties saw the return to 'small unit thinking' with the further downsizing of SBU's in order to enhance their competencies while creating new relationships with other firms in order to obtain additional competencies that were needed. Ojasalo (2002) refers to Emerson (1981) in describing the business network as a set of two or more connected business relationships in which each exchange relation is between individual business firms that are conceptualized as collective actors.

The need for strategic networks is based on the value-added chain as developed by M. Porter (1985). Partnership with other firms that can deliver the different non-core competencies indicated in the value-chain model enables the firm with core competencies to create a strategic network. All the value chain parts are represented by separate individual firms. Hinterhuber and Levin (1994) highlight that even in the 1990's strategic networks with a 'server' can be dynamic and flexible enough to survive and prosper in the global marketplace. They indicate how this concept is not entirely new, as illustrated in Figure 2.2, although the difference can be found in that it has moved from uncontrolled to a stage of controlled chaos.

It is important to consider the type of value networks that needs to be initiated in order to effectively function within a specific type of network construct. Parolini (1999) refers to the '*value-system construct*' where each product or service requires a set of value activities that is performed by a number of actors that form a value-creating system. The important goal to be attained with the '*value-system construct*' pertaining to the strategic network is to reach a level of determination of the value system that secures less uncertainty (Moller *et al.*, 2005). They developed a classification framework that combines the value-system information with the goals of actors and the structure of the strategic network. This framework is illustrated in Figure 2.3.

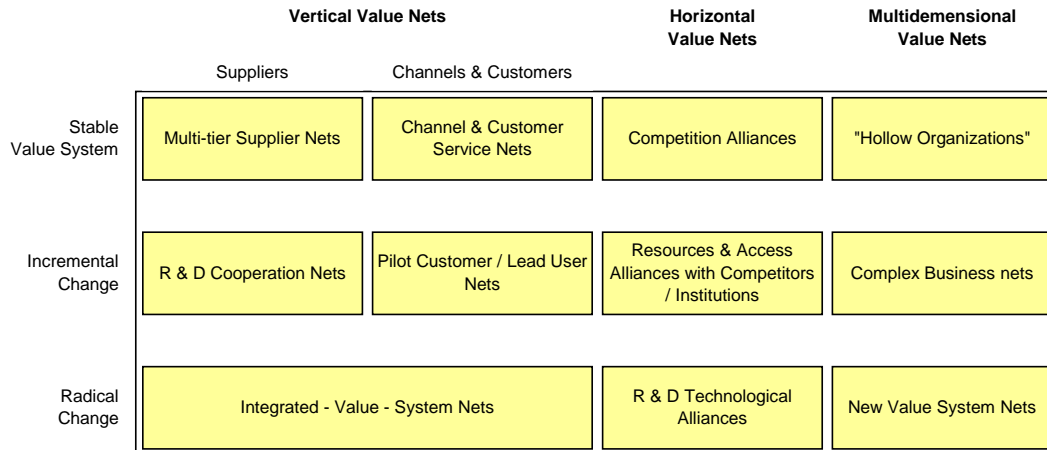


Figure 2.3 Types of strategic networks (Source: Moller *et al.*, 2005)

Hinterhuber and Levin (1994) point out that a strategic network is suitable to small and medium-sized web-firms in creating competitive advantage since:

- Small firms obtain competitive advantages by being lean, fast and flexible.
- Strategic networks create advantages of scale over larger competitors.
- Replacing network members as needed could enhance the creation of superiority in product or service delivery.
- It is easier to build a network from scratch than to break a larger firm into small units.

The entrepreneur of the firm with certain core competencies plays a critically important role in the creation and management of the strategic network. Ojasalo (2003) highlights the importance of key network management by the entrepreneur or network broker as:

- Identifying a key network
 - Identifying opportunities realizable in networked cooperation.
 - Selecting the actors of a key network
- Strategies for managing actors of a key network

- Developing and applying operational methods for managing actors of a key network.

Strategic networks tend to exist in specific geographic regions and they serve a particular geographic market. Porter (2001) identified a 'diamond' prerequisite that enables their existence in a particular geographic market namely: input that is related to necessary skills / raw materials; demand that relates to a large enough home demand for the products; related and supporting industries in a region; and structure and rivalry that exist between existing competitors.

The importance and business opportunities that strategic networks enable for the entrepreneur in the global marketplace increased with the development of ICT such as the Internet and the World Wide Web. These developments increased the importance of new elements such as information management whereby competitive advantage can be obtained with strategic networks in the global marketplace. Internet technology brought with it new products, services, business concepts, business platforms (e-markets in e-commerce) and new forms of cooperation such as virtual organizing.

The above discussion concentrated on the evolution of organizational constructs with emphasis on the application of strategic networks with SBU's based on the value chain concept of Michael Porter (1985) (which will be discussed in more detail in Sub-section 2.3.3). The next sub-section discusses the latest development of the so-called institutional or informal network introduced by the application of new technologies such as e-commerce.

2.2.3. The need for virtual networks in the global marketplace

Strategic virtual networks represent informal network constructs that consist of clusters of individual firms that allow for more coordination among their value chain members or actors. Manuel Castells (1996) notes that networks of independent organizations, also being referred to as the '*the network society*', are

or will be the dominant organizational model in the new era. It is important to consider the meaning of the term '*virtual*'. Bultje and Wijk (1998) identify four different sub-concepts of '*virtual*' that are used to define the virtual network organization:

- Virtual means '*unreal, looking real*'. '*Virtual Reality*' is a good example for this sub-concept of '*Virtual*'. It simply means that a '*Virtual Organization*' has the appearance of a real (traditional) company for externals, but in reality this company does not exist, it is only a conglomerate of independent network partners.
- Virtual means '*immaterial, supported by information and communication technology*'. This sub-concept of '*Virtual*' means that something does not physically exist, it is only created by data. For example, the '*Virtual Shopping Mall*' only exists on the Internet. The '*Virtual Office*' does not exist in physical terms; employees work from home and are connected to each other by ICT. The same applies to '*Virtual Products*', e.g., software, newspapers on the Internet, etc. Such products do not have any physical appearance, they only exist through ICT.
- Virtual means '*potentially present*'. This sub-concept can be defined as an attribute of an organization which does not really exist, but would have the possibility to exist (Scholz, 1996). As soon as the need for a certain configuration of organizations is spotted, an operating unit will be configured. The '*virtual Cluster*' represents the potential possibility to format any required network configuration.
- Virtual means '*existing, but changing*'. The dynamic network (Miles and Snow, 1992) follows this meaning of '*virtual*'. The organizational unit exists, but the composition of partners is temporary. This kind of organization reconfigures itself permanently; it is dynamic and progressive. On the company level such temporary networks are called

'*virtual corporations*', on the worker level such temporary networks are called '*virtual teams*'.

The virtual network organization does not exist in the global marketplace as a management fad or fashion. Mews (1997) identified two essential driving forces towards the virtual network organizational construct – the market and ICT. This is illustrated in Figure 2.4 and discussed next.

A Reasons for the existence of virtual network organization structures

Customers demand more specialized products, which automatically leads organizations to a broader product range. The effect of individualization of products to customer specification is that the complexity across all organizational functions increases.

This complexity can only be handled efficiently and effectively by advanced information and communication technology, and ICT is therefore, both directly and indirectly, viewed as an enabler and driving force towards the virtual organization.

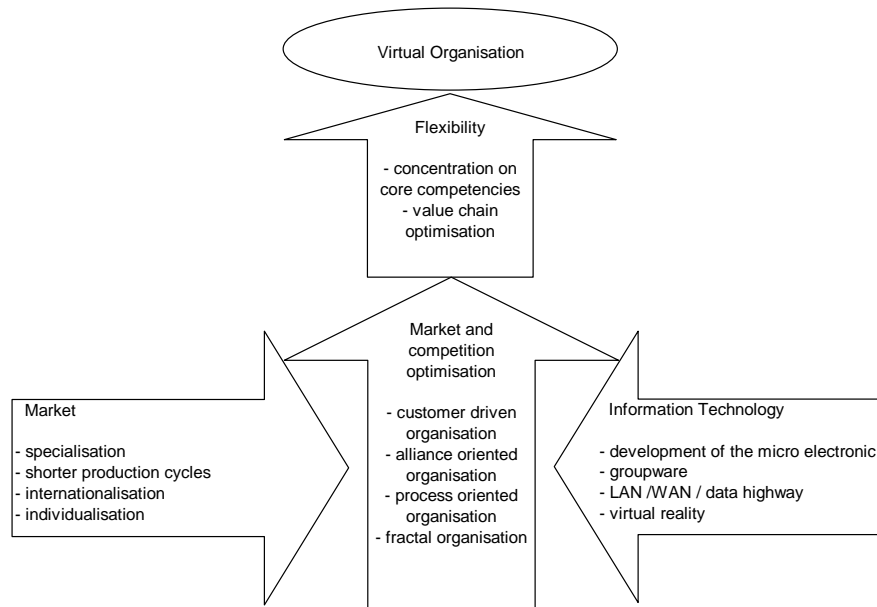


Figure 2.4 Driving forces towards virtual organizations (Source: Mews, 1997)

Mews (1997) indicates that both external forces (the market and ICT) lead to a changing business understanding that impacts on different business strategies. The overall goal of companies remains to improve their flexibility to meet the fast changing market conditions. The core competency strategy enables and supports the decrease in complexity and increase of flexibility. This strategy support economic actors to concentrate on what they do best, to specialize in certain areas, to develop and constantly improve their core competencies. Since core competencies by themselves do not create value, companies need to develop value chains in order to integrate their core competencies. The main objective is to develop an optimum value creation process whereby core competencies are flexibly configured into a value chain consisting of many different core competencies, provided by the different economic actors.

There are more reasons why the implementation of virtual network organizations is important to the entrepreneur who wants to compete in the global marketplace. 'Web-like' or rather 'virtual networks' support the flow of information that spans the traditional organizational boundaries. The virtual network of partners is a

logical outgrowth of the change in dominant logic in the operations of current markets in the information age. The virtual network enables the entrepreneur to better cope with uncertainties and complexities in the global business environment through the increase in his/her information processing capacity.

The virtual network potentially empowers all its value chain members to process information and to make decisions based on it (Jarvenpaa and Tanriverdi, 2002). Many advantages can be attained for the entrepreneur that participates in the e-marketplace by implementing a virtual network. They note how virtual networks contribute to '*transient, boundary-less, lateral, and computer-mediated organizational structures*'. They also explain that virtual networks are considered to be '*boundary-less*' since the way they are structured is not restricted by geography. The term '*lateral*' relates to the roles and routines in virtual networks where lines of authority are relationship-based and horizontal in contrast to the more traditional and mechanistic vertical organizational construct. Virtual networks are very different from the command- and control-based hierarchical structures and force the entrepreneur to establish different lines of action or approach in order to reach its strategic objectives of the virtual network. Virtual networks do not allow any of the traditional institutional or managerial authority typical of hierarchical constructs that can assist the entrepreneur in achieving the objectives of the virtual network of participating value chain members. Coordination, collaboration and production are still facilitated by the entrepreneur or network broker and are achieved by means of virtual organizing in the virtual network.

Another important advantage that can be obtained with the virtual network organization is that it tends to create networks of customers, suppliers and partners that enable the creation of information resources so vital in the new information economy (Jarvenpaa and Tanriverdi, 2002). Virtual network organizations are therefore not considered to be stand-alone entities but consist of a virtual network of independent firms that participate as partners, suppliers and customers in the virtual value chain.

Various management researchers consider the virtual strategic network organization to be a new form of organization. We consider the term '*virtual network*' or '*strategic network*' to describe a specific organizational construct that implements virtual organizing as the means to coordinate activities between the virtual value chain members. Various terms have been used to describe the firm that implements the virtual network organization structure. The more important ones include the '*virtual organization*' and the '*imaginary organization*'. The term '*virtual organization*' is the more favoured description of the virtual network used in the literature by researchers. It is important to consider the meanings attached to each of these terms in order to distinguish the differences in interpretation between them, if any.

B The '*Imaginary organization*' and the '*Virtual organization*'

The concept of the '*imaginary organization*' is very similar to the '*virtual network organization*' as discussed previously. Researchers on the concepts of virtual corporation and the imaginary organization view the whole network that consists of many small enterprises as an organizational entity (Kasper-Fuehrer and Ashkanasy, 2000). With a view to the imaginary perspective it is the entrepreneur that both imagines and realizes the construction of an organization or network. The entrepreneur in such a context is referred to as the '*imaginator*'. Sjostrand (2000) refers to Hedberg *et al.* (1997) who state that '*Imaginary organizations are artificial representations of what we see*'. He then explains how the '*imaginator*' is determined to share his vision with the virtual network of partners as well as the consumers in the e-marketplace. Hedberg *et al.* (1997) say that the '*imaginator*' has "...a fairly explicit vision of the final result in mind. However, it does not follow that they are capable of putting their visions into words or describing it to others".

Adopting the term "*imaginary organization*" allows and describes elements of information technology and human aspects which is more representative of its true nature (Gummesson, 1987). In all probability the term '*virtual organization*' was meant to include both elements of information technology and human aspects, as is the case with imaginary organization. Since the term '*virtual*

organization' is widely accepted in the literature we conclude that it's meaning or understanding includes both elements of information technology and human aspects as described above.

When the entrepreneur implements virtual organizing he is coordinating the division of labour or members of the value chain. The success of the entrepreneur at virtual organizing is dependent on how effectively and efficiently the virtual network performs. The network's performance can be judged by how its various parts or members interact. Effective and efficient coordination of many people or teams that need to act together in a virtual network in all probability secure its survival (Flores, 1986). Information technology and more specifically the worldwide web contributes to the coordination and the control of activities in a network of partners by a limited number of employees, thereby enabling web-based firms to be successful at virtual organizing. Black & Edwards (2000) states the following:

"When the new set of organizing rules is overlaid with the conditions and processes facilitated by the use of advanced communication and computing technology, virtual or network organizations are an emerging logical form for organizing".

Jarvenpaa and Tanriverdi (2002) continue by stating that '*at the societal level, these changes create a networked economy, which requires different strategies for leading*'. This view highlights the important question of how virtual organizing must be executed by the entrepreneur or so-called network broker in the virtual network of value chain partners.

The next sub-section considers aspects related to virtual organizing and the implementation of virtual network organizational structures for the entrepreneur that perform his activities by means of a web-based virtual network of partners.

C The virtual network organizational construct

Virtual networks are effective when delivering complex products in e-commerce. The web-based organization by means of the entrepreneur in his / her personal

capacity tends to act as network broker when delivering complex products in e-commerce. In the more complex form of the virtual web-based organization, the entrepreneur assembles a group of actors that share an informational platform. In its purest form, this group consists of various enterprises that are not necessarily based on the same continent but all contribute to the completion of a project. This scenario is especially valid in sectors of the market where innovative new product offerings tend to change the e-market scope continuously. Lefebvre and Lefebvre (2000) explain the workings of the virtual network organization as follows:

- The product integrator or network broker is responsible to conduct the virtual coordination of the physical and virtual value chains of the product offering. It is important that the product integrator implements standards accepted by all the trading partners in the value chain and that includes the clients. The implementation of acceptable standards enables the sharing of transactional, contractual and technical information that facilitates the design, manufacture and sale of the product.
- The first line of communication is with the client or consumer via the web-based organization acting as network integrator or network broker. This process allows for participation of the consumer during the design phase of the product offering enabled with the business platform linked to the 'web-face'. This business platform furthermore enables various value-added services such as research and reference services, exchange operations and retail sales or information services.
- The '*internal chain*' consists of the various business partners or value chain partners and includes subcontractors, suppliers and distributors that can be implemented in the product's value chain as required by the network integrator. Most web-based organizations tend to use business platforms to act as intermediaries between the integrator and the various actors in the value chain.
- The different entities (consumers / clients, product integrators, trading partners and business platforms) are electronically linked through the

Internet since it is considered to be an inexpensive worldwide communications platform. Some web-based organizations may opt for intranets and extranets in order to enable more secure internal and external connections in the value chain.

The business environment today can be described as global with fierce competition and with market opportunities that are transitory. One of the characteristics of virtual networks pertain to their ability to adopt to change. It is believed that business organizations are being subjected to consistent and ever increasing change. Stewart (1993) identifies some forces of change such as: the globalization of markets; the spread of information technology; the birth of the information economy; and the dismantling of hierarchy. Inrona (2000) indicates how these forces of change are simultaneous and inter-active. He then notes how these forces of change threaten not only the existence of many great corporations but cause the disintegration of traditional organizations and their untroubled environment.

The virtual network organization should improve on aspects of the previous organizational construct for speed, flexibility and fluidity (Byrne *et al*, 1993). Franke (1999) suggests the main emphasis of the virtual supply network is to complement and share resources in order to improve competitiveness as a whole. The main emphasis is on increased ability of participating SME's to compete on a large scale in the global marketplace. Scholtz (1997) notes the attractiveness of the virtual organization for small and medium sized enterprises since it provides the opportunity to sustain and increase its independence of large companies. In addition, entrepreneurial small and medium sized businesses can effectively compete with large multinational enterprises on a global scale in a relatively short time-frame.

The next sub-section considers aspects pertaining to the concept of the virtual organization.

2.2.4. The concept of the virtual organization

Virtual organizations can be viewed from structural and process perspectives. Sabeel *et al.* (2000) indicate that most definitions of the virtual organization apply the structural perspective of the virtual organization while only a few authors consider the virtual organization from a process perspective. Sabeel *et al.* (2000) refer to Mintzberg (1979) and Robey (1991) and how they relate the concepts of process and structural perspectives to virtual organization. The structural and process perspectives of the virtual organization are discussed next.

A The structural perspective

The structural perspective of the virtual organization relates to the mutual relationships that exist between a set of independent organizations that enables them to function as a single organization to reach their common goal. The virtual organization consists of elements (activities, resources including core competencies), actors (organizations, individuals) that are interrelated with control structures, interdependencies and exchange relations. The concept of the virtual organization supports the idea that various organizations contribute core competencies to the success of the organization. Introna (2000), however, points to the difficulty firms may experience in determining their specific core competencies. Typical properties that authors relate to the virtual organization include their temporariness (Byrne *et al.*, 1993; Wuthrich and Philip, 1998); and their intrinsic ICT-based approach (Byrne *et al.*, 1993). Introna (2000) highlights some difficulties experienced with the implementation of virtual organizations since not all potential members to the value chain will automatically accept and commit to the explicit goals of the virtual network. Introna (2000) continues to indicate how “*extensive renegotiation and realignment of the goals in the process of integrating partners*” *core competencies reveal the loss of the very focus that constituted the core competencies in the first place*”. Table 2.1 shows an overview of the dimensions that are used to describe the structure of virtual organizations.

Table 2.1 Dimensions of structure (Source: Sabeel *et al.*, 2000)

Organizations participating in a virtual value chain tend to pursue some common

Term	Definition
Goal-specificity	Activities and interactions of participants are co-ordinated to achieve specified goals. Goals are specific to the extent that they are explicit, are clearly defined, and provide unambiguous criteria for selecting among alternative activities (Scott, 1998).
Formalization	The co-operation among participants is conscious and deliberate; the structure of relations is made explicit and can be 'deliberately constructed and reconstructed'. A structure is formalized to the extent that the rules governing behavior are precisely and explicitly formulated and to the extent that roles and role relations are prescribed independently (Scott, 1998).
Modularity	The extent to which the virtual organization is based on integrated, customer-oriented processes composed of relatively small, manageable units (modules). These units are characterized by a decentralized decision-making competence and responsibilities. These are units, consisting of assignees, which can belong to different legal institutions (Wigand et al., 1997).
Heterogeneity	The extent to which the components of the organization have different performance profiles with regard to their strengths and competencies (Wigand et al., 1997).
Time and spatial dispersion	The extent to which the components of the organization are dispersed in place and time (Wigand et al., 1997).
Purpose	The objective that provides the incentive for creating the new organization and which serves as the cohesive force to hold the virtual organization components at least temporary together (Shao et al., 1998).
Connectivity	The creation of unity or linkage through structural change, breaking of constraints, or overcoming of previously existing barriers (Shao et al., 1998).
Boundary	An indication for the separation of those who are part of the virtual organization and those who are not, in the absence of clearly visible physical border lines (Shao et al., 1998).
Technology	The enabling factor that allows the breakthrough and makes the virtual form possible (Shao et al., 1998).
Complexity and diversity.	The number of different items or elements that must be dealt with simultaneously by the organization (Scott, 1998).
Uncertainty or unpredictability	The variability of the items or elements upon which work is performed or the extent to which it is possible to predict their behavior in advance (Scott, 1998).
Interdependence	The extent to which the items or elements upon which work is performed or the work processes themselves are interrelated so that changes in the state of one element affect the state of the others (Scott, 1998).

purpose. This common purpose is described in the literature as “*to produce and offer collectively and rapidly a product or service that the market demands*” (Franke, 1999). Sabeel *et al.* (2000) indicate that the virtual organization can be considered to be formalized since the structure of relations within the virtual organization is made explicit by consciously formulated agreements and procedures.

Many authors support the model of the virtual network in suggesting that it consists of distinct operating entities that are (legally) autonomous or

independent (Franke, 1999; Strader and Shaw, 1997). Sme's participating in virtual networks verify the idea of the organization as consisting of modular units that are small but manageable units with decentralized decision-making. Connectivity relates to the leverage of cooperation where communications technology plays the role of enabler of virtual network coordination. Boundaries define which members are considered to be part of the virtual organization value system in the absence of clear visible and physical borders. The structure perspective of virtual organizations allows for horizontal and vertical value chain integration since partnerships can be introduced with individual rival companies where the necessary resources and know-how are lacking in the development, production and distribution of new products developed.

B The Process perspective of the virtual organization

Sabeel *et al.* (2000) refer to Ackoff (1971) in identifying process as '*goal-producing behaviour that is composed of events that constitute changes in the structural properties of the system of its environment*'. This implies the need for virtual organizations to continuously consider their system processes in order to adapt to changes in the global marketplace. Such changes might negatively impact on the efficiency in obtaining other strategic goals of the virtual organization. Sabeel *et al.* (2000) refer to Katzy (1998) in explaining the process of design and implementation of the virtual organization as illustrated in Figure 2.5.

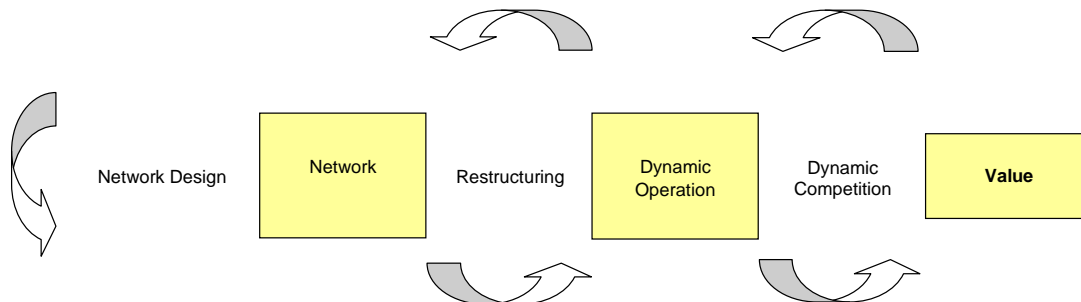


Figure 2.5 A conceptual model of the design and implementation of virtual organizations (Source: Katzy, 1998)

This model illustrates the dynamic mechanisms as (a) The network that consists of the relevant pre-existing industrial structures , i.e., relationships with partners in a trusted cooperation or a market, pre-existing resources as well as experienced routines and processes; (b) The virtual operation as the cooperative process that combines competencies and resources for the period needed to realize value; and (c) Value considered as the force that drives the virtual network to restructure. Change processes in the virtual organization concern the design of the network, the restructuring of the dynamic operation and the creation of new business opportunities or dynamic competition.

The process perspective of the virtual organization as described by Sabeel *et al.* (2000) seem to be the most effective approach when defining the so-called '*virtual organization*'. In understanding the term '*virtual organizing*' as a strategic approach, focused on creating, nurturing and deploying intellectual and knowledge assets while sourcing physical assets in a complex network of relationships, the virtual organization is described as a process or a function of organization. The virtual organization is then considered to be a virtual network of organizations that implements virtual organizing as the means to coordinate its activities in the e-marketplace. This view regards the process as more important than the form of the organization.

In adopting the process perspective of the virtual organization, it is acknowledged that the virtual structure network of companies is combined with virtual organizing in order to best accommodate the '*new information economy*'. It might be of value to use the term '*virtual network*' in place of '*virtual organization*' in future discussions as referring to the web-based organization that opts for virtual organizing as the means for coordinating its value chain operations. Since virtual organizing suggest some important changes to the way the network is configured

as described by Sabeel *et al.* (2000), it affects the understanding of the virtual network by its participants and all other stakeholders in the value chain.

The next section considers aspects pertaining to the role of information technology in virtual networks.

2.3. The role of information technology in web-based organizations implementing virtual networks

In the early stages of technology development, technology was considered to promote efficiency in organizations which would contribute to realizing savings in labour costs. Technology was seen to have the potential to contribute to the enhancement of the span of control, thereby facilitating the development of concepts such as '*self-organizing knowledge workers*'. A further advantage of technology was its contribution to facilitating inter-organizational coordination of business over vast geographical distances. Sjostrand (2000) also highlights how information technology '*contributes to flexibility by remodelling the systems for measurement and control which could lead to structural change of the organization*'. In the initial phase of its development, information technology was not considered to make a contribution to organizational development. Information technology would be implemented to contribute to the automatization and computerization of existing structures making business faster but not necessarily better (Sjostrand, 2000).

Information and communication technology has always been recognized as an essential variable in management theory. This is particularly visible in the way computers are linked in networks that has the ability to collect, analyze and distribute information. The first part of this section considers the development of the role of information technology in the coordination of business. The second sub-section looks at resources and competencies theory. Part three considers

value chain configuration and its importance with virtual organizing and the last section considers the role of e-commerce.

2.3.1. Virtual organizing in virtual networks

Researchers seem to differ on the role of information technology when conducting virtual organizing activities in the virtual network of partners. Some consider the worldwide web to be nothing more than an enabling technology (Porter, 2001; Strader *et al.*, 1998). Others refer to the worldwide web as a new channel disregarding its potential to be a new global marketplace (Porter, 2001; Bhatt and Emdad, 2001). Others link the role of information technology to the distribution of knowledge and information in digital form, although raw materials and hard goods still require physical distribution. The worldwide web plays a potentially important role in supporting activities related to inventory, logistics and production management. It furthermore saves on costs (Porter, 2001), with real-time processes made possible although researchers seem to differ on productivity gains that can be attained with the introduction of worldwide web technologies.

Since the term '*virtual organization*' suggests virtual strategic networks of partners that implement virtual organizing, it is to be expected that members to the virtual value chain are geographically dispersed. This might well be the case where a specific firm with control over specific valued resources and competencies needed to successfully exploit a business opportunity, is geographically dispersed from the other members of the value chain. Marshall *et al.* (2000) indicate the challenge that exists with regard to communication and co-ordination activities across different time zones, locations, cultures and languages. These important characteristics related to the dispersion of the virtual network organization can be illustrated as follows.

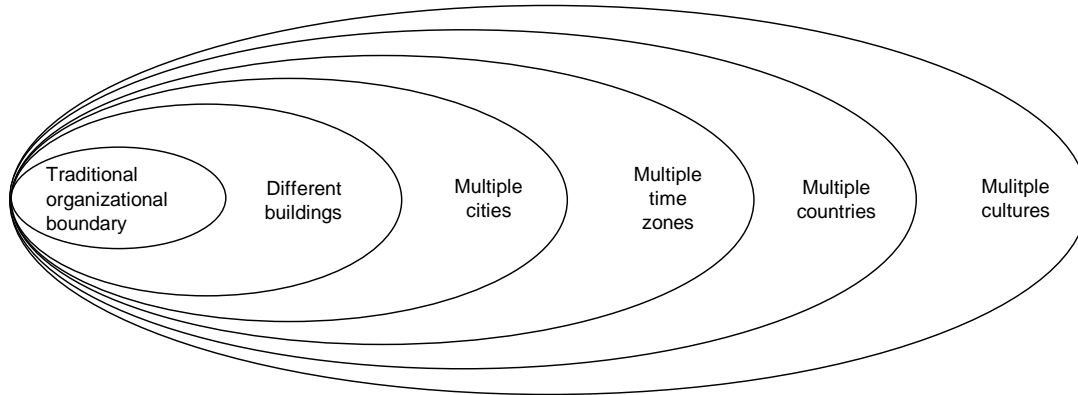


Figure 2.6 Characteristic dispersion of the virtual network organization
(Source: Marshall *et al.*, 2000)

The virtual network consists of a digital network of separate firms that remains a separate entity but is required to function as an integral part of a greater organization. It is therefore important to consider the needs and opportunities that can be created for computer-enabled virtual organizing. Virtual organizing implies the management and coordination of digital virtual network organizations (Ching *et al.*, 1996). There are two approaches used in the formation of a digital network namely downward and lateral (Ching *et al.*, 1993). They indicate that downward networking is implemented by a large, vertically integrated firm that intends to reduce its overhead costs by means of downsizing or outsourcing. The lateral approach again refers to specialized firms that implement value-adding partnerships in an effort to achieve a strategic alliance.

Information technology enables the coordination of activities that transgress the conventional borders of the institutionalized formal organization. The network broker needs to coordinate the digital network as it grows, shrinks, and evolves over time. Efficient and effective coordination is essential for the survival of digital networks in the global marketplace in the long term. Ching *et al.* (1996) note the complexity associated with coordinating digital networks as follows:

“Balancing structural flexibility with the fair amount of commitment among firms is a nontrivial task confronting a core firm when managing its network”.

ICT developments furthermore also influence the way in which organizations can and will be structured in future. In the earlier stages of the development of information technology it was not considered to have an impact on organizational development. The focus then was more on automatization which did not address the problem of old routines and structurally related issues of organizations. Sjostrand (2000) refers to Savage (1996) when indicating how automatization and computerization of existing structures improved the speed in performing tasks although not necessarily making them better. When considering the interaction between technology and organizations it is important to realize that the development of information technology in organizations is a social phenomenon. When considering the impact of information technology on the coordination of virtual networks, both the material and social dimensions should be considered (Sjostrand, 2000).

Crowston and Malone (1994) define coordination as the process of managing dependencies among activities. Sjostrand (2000) explains how the field of (intra) organization theory has always recognized the concept of coordination. He refers to March & Simon (1958) when stating *“The type of coordination used in the organization is a function of the extent to which the situation is standardizes. [...] We may label coordination based on pre-established schedules coordination by plan, and coordination that involves transmission of new information coordination by feedback. The more stable and predictable the situation, the greater the reliance on coordination by plan; the more variable and unpredictable the situation, the greater the reliance on coordination by feedback”*. This definition applies to traditional organizational theories. The need exists within many organizations adopting the network metaphor as their guiding principle for organizing to extend the traditional intra-perspective and apply it to the inter-organizational context (Sjostrand, 2000). He discusses the important way in which *‘coordination and management have traditionally been viewed in top-down, rational, and beforehand (planning) perspectives’* that is, in a somewhat static

context. He refers to Larsson *et al.* (1998) when explaining that such perspectives *'tend to disregard the horizontal, ad hoc and dynamic aspects characterising the network organization'*.

When the virtual network is viewed from a dynamic perspective, i.e., as a process, the actions conducted with regards to the web-based organization become the main focus. In this way the virtual network is considered to be a network of organizations in a transient process between temporary structures.

Sjostrand (2000) explains with reference to Schultze and Orlikowski (2001) that coordination considered in a social context should not be restricted to information processing only. He continues to explain that coordination also involves communication and action. Coordination between actors furthermore requires constant adjustment and modification of habits and habitation. Actors in networks can be understood as being embedded in patterns that represent social relationships. Such actors must be considered as valuable to the entrepreneur since they develop institutions that can provide new opportunities. All relevant actions as well as relations and institutions influence behaviour. The ability to secure efficient and effective communication between members is vital for coordination that enables interaction determines the border of a network. This is what Castells (1996) refers to in stating that:

"Networks are open structures, able to expand without limits, integrating new nodes as long as they are able to communicate within the network, namely as long as they share the same communication codes".

Technology that enables computer mediated communication should support coordination in organizations. Sjostrand (2000) refers to Winograd & Flores (1986) in highlighting the importance associated with communication when the organization is viewed as consisting of a network of communication processes. Winograd & Flores (1986) state as follows: *"People in an organization (including, but not limited to managers) issue utterances, by speaking or writing, to develop the conversations required in the organizational network. They participate in the creation and maintenance of a process of communication. At the core of this*

process is the performance of linguistic acts that bring forth different kinds of commitments”. They continue to suggest that “*The conversational dimension permeates every realm of coordinated activity, whether it be computer programming, medical care, or selling shares*”.

Information and communication technologies enable commercial and industrial activities to be conducted virtually. Lefebvre & Lefebvre (2000) consider the transition of the traditional to virtual network as a succession of technological waves as indicated in Figure 2.7.

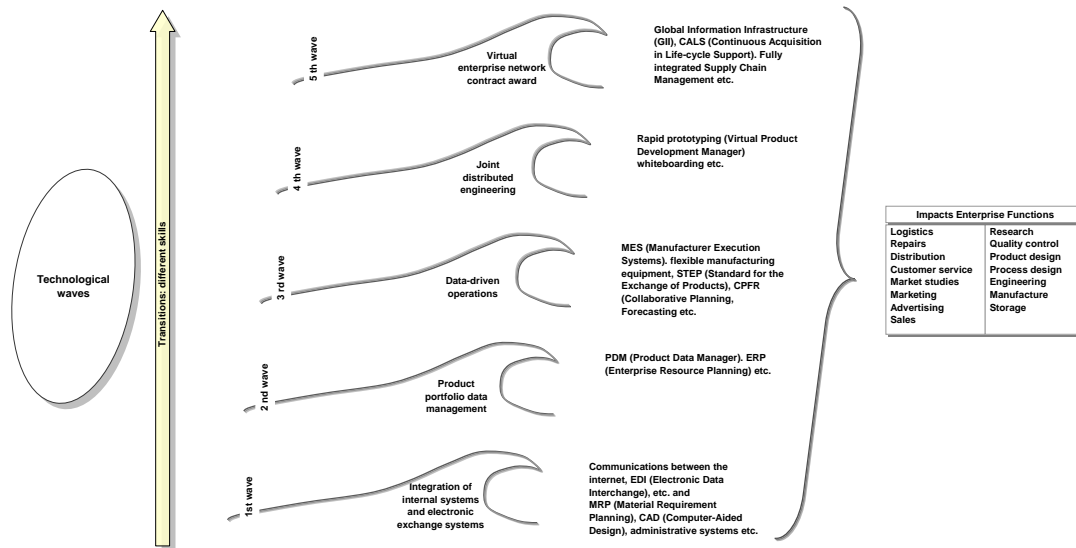


Figure 2.7. Transition from the traditional to the virtual enterprise
(Source: Lefebvre and Lefebvre, 2000)

Figure 2.7 indicates the process where the firm progresses with each successive wave to become technologically more complex than previously. The impact of the ‘*technology push*’ on business should never be considered as an end in itself. Each successive wave implicates a re-evaluation of the various functions of the enterprise and the need to consider the required changes in skill sets that it entails.

The first wave requires the integration of various internal enterprise systems, administrative (e.g., invoicing) and otherwise (e.g., inventory control). This phase allows for internal (among employees of the undertaking) and external (among its clients, suppliers and other business partners) integration to electronic links that may be used for commercial activities (on-line sales, on-line purchasing). Companies and consumers then obtain information by visiting the web-sites and download data. The requirements with regard to skills and structural change increase as the organization progresses to the next phase where the last wave corresponds to the virtual enterprise in its most complex form. During the final stage, all value chain partners concentrate on activities relevant to their contribution to the final product. These activities happen in real time and typically include the design, production, marketing, distribution, after-sales service, and recuperation and recycling of the product irrespective of the value chain enterprise location. The fifth wave allows for complete exploitation of e-markets while all functions are performed in a network of enterprises. The final phase includes for each partner's systems to be interoperable, while all commercial and technical data (including product specifications) are digitized. All activities related to exchanges between value chain partners, tendering and bidding are performed globally by electronic means. The progression of web-based enterprises in this model depends on the sector or industry it functions and therefore its product offering.

Marshall *et al.* (2000) refer to Grenier and Metes (1995) in identifying the information intensive nature of virtual networks, which explains its reliance on information technology. The role of information technology in terms of the virtual network is well documented. Some of the opportunities that information technologies enable, support the virtual network to do the following:

- Underpin and enable the propensity for opportunistic behaviour.
- Support the designing and producing of new goods and services.
- Provide a fast and convenient channel through which to promote its products and services.

- Inform potential customers of organizational product and service developments.
- Accept and process sales to customers in real time.
- Provide a communication and information framework to conduct work in the organization in real time. (Marshall *et al.* 2000).

Individual web-based businesses utilize ICT (as the means to conduct business operations in the global marketplace) to various degrees although the importance of ICT as the enabler of e-commerce business and its capacity to improve effectiveness and efficiency in the 'Information Economy' are well documented (Marshall *et al.*, 2000).

This sub-section focused on the role of information technology in coordinating virtual activities between the virtual value chain partners. Next, it will be helpful to focus on the critical role and importance of resources and competencies in the virtual network. To this end the next sub-section considers the implications of resource-base and competence-based theories for the virtual network configuration of value chain members.

2.3.2. Resource-based and competence-based theories and their relevance to virtual networks

In the nineties, business successes were linked to the concept of strategic alliances being implemented in fast-growing markets. This strategy seemed especially apt in situations where a company was restricted by a shortage of financial assets (Cwik, 1998). In recent times the characteristics of product and service offerings in e-commerce are changing in rapid and quick succession, impacting on the way the virtual value chain is constructed. At present the e-marketplace is experiencing a growth of digitized products and services that are intangible and difficult to observe although it must be acknowledge that this trend is more prominent in the technology and science-based sectors. Entrepreneurs

play an important role in managing such tangible and knowledge-based intangible assets and products since these assets are linked to innovative and fast-changing value creation in e-commerce. The problem experienced with knowledge-based intangible products relates to their value in the marketplace, property rights that are ill-defined for intangible assets, and the exclusion of non-owners from the benefits (Jarvenpaa and Tanriverde, 2002).

In the next two sub-sections, we investigate the implications of resource-based theory and competence-based theory for virtual networks configuration and their implications for the entrepreneur when constructing the virtual value chain.

A The resource-based theory

According to the resource-based theory, the source of a company's competitive advantage lies in the bundle of resources that the company can control (Ordanini and Pol, 2001). The need to form a virtual organization can be linked to the inadequacies of resources and the need for timely response to turbulent global business environments. Marshall *et al.* (2000) refer to Turban *et al.* (1999) who, when defining the virtual organization, highlights the important role of resources in the virtual network construct.

"...as composed of several business partners sharing costs and resources for the purpose of producing a product or service. [It] can be temporary... or it can be permanent. Each partner contributes complementary resources that reflect its strengths, and determines its role in the virtual corporation" (Turban *et al.*, 1999:).

Pihkala *et al.* (1999) describes the resource-based view of the firm as important to virtual networks since it highlights and considers firms to be heterogeneous regarding both their resources and capabilities. Amit and Schoemaker (1993) consider the meaning of the term 'resources' to be heterogeneous and to include both resources and capabilities (Peteraf, 1993). They describe resources as convertible, externally available and transferable, and owned or controlled by the firm. Pihkala (1999) notes that the virtual organization has emerged to create flexible and efficiency, i.e., to enable better exploitation of resources and

development of capabilities within groups of organizations. This reasoning for the need to creation of a virtual network indicates the importance of each member of a value chain contributing resources to the value creation process. Peteraf (1993) considers the concept of resources and especially the use of internal or controllable resources as central in the resource-based theory.

According to the resource-based theory, competitive advantage occurs only when there is a situation of resource heterogeneity (different resources across firms) and resource immobility (the inability of competing firms to obtain resources from other firms) (Barney, 1991).

To this Grover *et al.* (1998:84) add “*the essence of a resource-based theory is that given resource heterogeneity and resource immobility and satisfaction of the requirement of value, rareness, imperfect immitability, and non-substitutability, firms’ resources can be a source of sustained competitive advantage*”.

Resource-based theory therefore treats enterprises as potential creators of value-added capabilities (Caldeira and Ward, 2003). Understanding the development of such capabilities and competencies involves viewing the assets and resources of the firm from a knowledge-based perspective (Prahalad and Hamel, 1990). This is discussed next.

B The Competence-based theory

The competence-based theory (as developed by Prahalad and Hamel, 1990, 1997) relates to the concept of core competencies in organizations and was first introduced in the nineties. Core competencies can be explained as the bundling of specific capabilities and technologies that can serve as the basis for the development and provision of several products. The value of core competencies to enhance the competitive advantages of net organizations using virtual organizing is an important consideration for the entrepreneur when constructing a value chain. Prahalad and Hamel (1990: 81) state that the consequence is “*. real sources of advantage are to be found in managements ability to consolidate*

corporate- wide technologies and production skills to competencies that empower individual businesses to adapt quickly to changing opportunities”.

Prahalad and Hamel (1990) conclude that when companies concentrate on bundling their core competencies and resources it will be more successful at developing new products and markets. They also indicate that it is more likely that any given company will have more than one core competence, although few have more than five or six competencies at their disposal (Prahalad and Hamel, 1990). They describe the function of core competencies as follows: *”Core competencies are the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies”.*

Core competencies deliver strategic advantages and increase the strategic potential of a company to create durable competitive advantage since they support the development of new markets in a short time span while contributing to the value of the product offering that is difficult to imitate. Prahalad and Hamel (1990) note that: *“...a real source of advantage is to be found in managements ability to consolidate corporate wide technologies and production skills into competencies that empower individual businesses to adapt quickly to changing opportunities”.* Companies that succeed at identifying needed competencies and in bundling needed resources will be more effective and efficient at developing new products and markets (Prahalad and Hamel, 1990). Core competencies improve the strategic potential of the company to successfully participate in a value chain. The core competencies that a company develops and maintains is not limited to only specific products or services and is not linked to only one function in a particular organization. Any company therefore has a strategic portfolio of competencies which, if combined with resources that leverage its specific portfolio of competencies increase the potential for the introduction of innovative products to the global marketplace.

The virtual network can therefore be considered to consist of a portfolio of strategic business units and competencies. Virtual networks successful at

allocating resources that incorporate core competencies needed in the value creation process can improve its competitiveness in the global marketplace. The strategic potential of individual companies participating in the virtual network in a sense depends on their unique set of core competencies (Pitt and Clarke, 1999), and must be considered to be an integrated part of all processes of the virtual value chain. Cwik (1998) furthermore indicates how companies successful in their attempts to combine various competencies and resources in the value creation process do not react upon market trends, they simply create them. The core competence approach is very similar to the resource-based view of strategy in that every potential firm participating in a virtual network attempts to create a specific uniqueness by locating and improving its main competencies.

Virtual networks with their additional characteristics of agility (Metes *et al.*, 1998) are most suitable to utilize the existing resources and competencies of the different members in the strategic network. The most important consideration for a web-based organization to implement a competence-based approach with its value chain creation lies in the nature of virtual networks that implements virtual organizing. Marshall *et al.* (2000) importantly highlight that acquiring and developing the required resources and competencies, needed to exploit an opportunity, might be too time consuming and costly for the entrepreneur with a web-based organization when rapid response to a new opportunity in the e-marketplace is needed to secure success. They indicate that the entrepreneur who implements a virtual supply network of partners with access to the additional needed knowledge, skills, resources, and infrastructure required to successfully exploit a new opportunity in the e-marketplace will increase his/her potential to be successful, even if only temporary in nature.

The competence-based approach holds strategic potential for virtual networks to create durable competitive advantage by contributing to the value of the product that makes it difficult for competitors to imitate. In its attempts to satisfy the need of the customers the web-based organization develops new and innovative value offerings suitable to the specifics of the e-marketplace. This new product or service offering is then related to the identification of new core capabilities and

complementary assets (resources) as well as the identification of new virtual network members that possess the necessary assets and capabilities. The core competence approach allows for web-based companies to concentrate on their core products. When a company is unable to produce a product or component at a quality level necessary to succeed in global competition it can be outsourced to potential partners.

The next sub-section considers the interrelated role of the virtual value chain and resources and competencies in the web-based organizations' attempts to satisfy the needs of customers in the global e-marketplace.

2.3.3. Virtual value chain and its application to virtual networks

The value chain concept (developed by Michael Porter, 1985) analyzes and views the organization as a process of value-creating activities with the two identified types of value-creating activities defined as primary and support activities. Primary activities contribute to the physical creation of the product or service as well as its sale, transfer to the buyer, and its service after the sale. The support activities include procurement, human resources management, technology development and firm infrastructure and add value through its relationships with both primary and other support activities. Hinterhuber (2002) identifies the creation of the value chain as a process consisting of six steps, namely:

- Analysis of internal value chain, consisting of an internal perspective on costs and value added at each step. The effectiveness of internal operations is reviewed in comparison to leading competitors in order to determine future action.
- Analysis of flow of goods and total value created by the extended value chain. It is understood that a business' internal value chain is seldom considered the only point where value can be added to the final product. It

is vital that all upstream or downstream industries that come into contact with the product and add value or could add value to the product be considered. This entails that the subsequent contribution of each industry to the overall product value created must be determined.

- Identification of ways to increase the amount of value created by the extended value chain. Value creation by means of innovative thinking about quality of products or reducing costs is the target.
- Configuration of network around identified opportunities of value creation, consisting of selected partner companies and determining an adequate structure with selected partner companies.
- Identification of ways to capture value created. With virtual organizing this implies partnering companies that belong to different industries in order to create strategic alliances.
- Management of cross-industry value chains, entailing coordination activities where the entrepreneur/network broker needs '*value creation insights*' in order to fully manage and develop the virtual network. Information management between partners is considered as crucial.

As noted before, there are two variations of virtually structured networks, namely, downward and lateral networks. The lateral network will be discussed next, since it relates to the value-added chain concept of Porter (2001).

With the lateral approach specialized firms constitute a value-added chain that relates to the virtual value chain. Each of the participating firms in a value chain can benefit by being adaptable and responsive (specialization strategy) while also creating scale of economies benefits. The network broker resumes the responsibility in the value chain to direct the coordination in the network and monitors relationships with existing and potential partners in the virtual organization (Ching *et al.*, 1996). The network broker that implements a value chain in order to realize the specialization (core competence) strategy should

consider various strategies in doing business in the global marketplace. This will be addressed in sub-section 2.3.4.

In the physical value chain, both material and information flows happen. The importance of information flows increase where value chain activities are performed in a virtual setting made possible with the advances in communication technology such as the Internet. The virtual value chain enables e-commerce and the importance of information in conducting activities in the value-chain increases exponentially. Most activities identified in the value chain can be performed via electronic mode by means of virtual organizing (Levebvre & Levebvre, 2000). Rayport and Sviokla (1995) explain the virtual value chain as consisting of the gathering, organizing, selecting, synthesizing and distribution of information. It is essential that business integrates virtual value activities with physical activities in its offering of customized products and services in the e-marketplace (Phatt and Emdad, 2001). The impact of information management on the virtual value chain is illustrated in Figure 2.8.

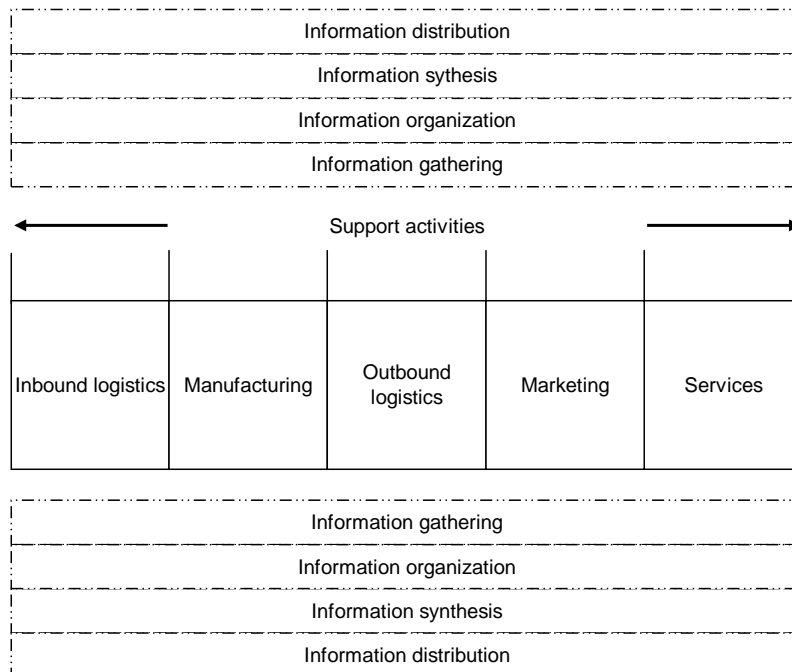


Figure 2.8 Information and its impact on the virtual value chain
(Source: Rayport and Sviokla, 1995)

The physical value chain activities realize the transactions in e-commerce by fulfilling customer orders that consist of assembling final products and services. E-commerce transactions are enabled by means of information flows between members of the value chain while the execution of physical activities still require the acquisition of tangible material, tools and technologies and physically implementing them in creating final products and services (Bhatt and Emdad, 2001). Effective and efficient integration of the physical and the virtual value chain activities secures successful virtual organizing. Various complexities can be linked to the implementation of the virtual value chain. One such consideration is the creation of '*a mutual orientation of two firms toward each other*' that is based on the exchange processes happening between participating firms (Johanson and Mattsson, 1987). They also refer to the importance of the '*learning process*' and '*adaptation process*' that seems to be part of such an exchange process. Ching *et al.* (1996) explain how the participating firms seem to learn to '*fit*' with each other. This need to adapt relates to various aspects such as technical, logistical, administrative and financial considerations. When the network broker shares in information with the existing partners (including the working of the network, technological and marketing developments) it contributes to the process where partners can learn (Ching *et al.*, 1996). They stress the importance of introducing nurturing and disciplinary behaviour in order to prevent opportunistic behaviour or any incompetent performance of a participating firm in the virtual value chain.

Although most brick and mortar companies implement virtual organizing to some extent, most hierarchical structured organizations avoid performing virtual activities for strategic reasons. As we moved into the new millennium, more companies turned away from vertical integration (hierarchical) to engage in contractual agreements with other companies based on a different set of reasons

and motivations (Hinterhuber, 2002). Many different types of inter-firm alliances are being employed such as outsourcing agreements and strategic alliances.

Some sectors of business in the global marketplace have been more aggressive at adopting virtual activities. This is especially '*visible*' in the banking sector where physical location is becoming less important with regard to performing banking transactions. The virtual value chain offers various advantages to web-based businesses participating in the e-marketplace. The virtual value-chain is applicable to and explains the value-added activities of web-based organizations. Especially web-based organizations active in the manufacturing and service sector perform more complex activities in order to be successful in e-commerce and create new opportunities with the implementation of virtual value chains (Levebvre & Levebvre, 2000). The value chain approach also offers more advantages such as the creation of competitive advantage in the e-marketplace (Lumpkin *et al.*, 2002). This will be discussed in some detail in sub-section 2.4.2.

The advantages of virtual value chain networks that can be obtained from implementing virtual organizing include risk sharing, increased organizational competencies, access to new markets and the possibility of inter-organizational learning (Hinterhuber, 2002). We therefore consider the virtual value chain as the creation of inter-business networks that are purposefully configured along an extended, cross-industry value chain.

The main objective of creating a web-based organization that implements virtual organizing to coordinate virtual value chain activities for the entrepreneur is to create fundamentally new e-markets in e-commerce. The pace of e-business pertaining to shorter product life cycles necessitates quicker reaction to new market opportunities (Strader *et al.*, 1998).

The virtual value chain enables web-based organizations to participate more successfully in e-commerce that requires quick response in the global marketplace. Virtual value chain activities for successful participation in e-commerce pose specific communication needs. This is discussed next.

2.3.4. The impact of e-commerce on virtual organizing and the virtual value chain

E-commerce and more particularly e-markets force web-based enterprises to continuously improve their business processes between virtual value chain partners. As indicated in the previous section, the main difference between the virtual value chain and the physical value chain relates to the essential role of information and information management when conducting business in the new e-marketplace. It is therefore important to consider the impact of electronic commerce on the structuring of the web-based virtual network and to consider the competitive advantages that could be attained with the virtual value chain.

The main function of e-commerce is the use of electronic means to exchange information and support the process of carrying out activities and transactions. The Internet supports the network broker to make information available to all members of the virtual value chain in real time (Bhatt and Emdad, 2001). This enables all participating value chain members to position themselves in order to anticipate demand fluctuations and to respond accordingly. Boyson *et al.* (1999) indicate how Internet-enabled shared information helps break down organizational policies and functional fences, thereby supporting supply-chain alliance members to develop a common understanding of the competitive environment.

Lefebvre and Lefebvre (2000) referred to the Forrester Research Report (2000) in stating that inter-firm e-commerce is responsible for 80% of the activity found in e-commerce. Lumpkin *et al.* (2002) indicated that business-to-business sales were estimated to reach \$6.1 trillion by the end of 2004. The importance of e-commerce as the means of performing business will only increase in future.

According to Strader and Shaw (1997) the electronic marketplace represents an *'inter-organizational information system that allows participating buyers and sellers to exchange information about prices and product offerings'*. E-markets presuppose an electronic or online system that facilitates transactions between

buyers and sellers. It potentially provides support in each phase of the order fulfilment process (Strader and Shaw, 1997). The impact of electronic commerce on e-markets relates to market participants, traditional and newly created industries as well as the global economy. Strader and Shaw note that electronic markets in many sectors have transaction cost advantages over traditional markets and identify it as the main contributor to the expected growth in online markets. Rayport and Sviokla (1995) indicate how the World Wide Web can be viewed as a strategic information technology with the potential to change the basis on which businesses interact with their consumers.

There are more factors impacting on the use of e-commerce when considering various industries in the global marketplace. Strader and Shaw (1997) give four factors that determine the potential of e-markets with regard to industries:

- Product characteristics. Digitizable products are more suited for electronic markets with a resulting low transaction cost. This is made possible when taking advantage of the digitization of the market mechanism and distribution mechanism. Risk for the buyer is a factor when considering product price and where consumers and sellers are geographically dispersed.
- Industry characteristics. The level of standards that exists in an industry for describing products impacts on e-markets. Future developments in multimedia capabilities incorporated into electronic market interfaces will enable more effective description of products and services.
- Seller characteristics. If sellers in a particular industry are unwilling to participate in e-markets, e.g., in oligopolistic situations, they would control the success of e-markets in that industry, thereby enforcing lower volume, but higher profit margins.
- Consumer characteristics. Consumers are considered as either impulsive, patient or analytical. Impulse buyers do little analysis while patient buyers

do some comparisons, with analytical buyers doing substantial research before making the decision to purchase products or services.

From the consumer's (external) point of view, the more important issue then is what incentives exist for the consumer to turn to the Web for satisfying their needs. The advantages which e-commerce offers the entrepreneur and SME's are numerous. Jarvenpaa and Todd (1997) indicate that the high expectations surrounding the consumer potential of the World Wide Web can be linked to its perceived business advantages, the socio-demographic changes taking place, as well as its unique features as a direct marketing channel. The more important advantages that can be attained for the entrepreneur with a web-based business include visibility and direct, inexpensive access via the World Wide Web to international markets. Strader and Shaw (1997) indicate how e-commerce supports buying and selling of information, products and services via computer networks. That includes any of a myriad of networks that make up the Information Superhighway. Three types of entrepreneurial networks have been identified namely physical, virtual and hybrid networks (Von Biedermann, 2004).

- Physical networks supports an environment of better control, access to informal information but are somewhat limited in range and more cost- and time-consuming to maintain.
- Virtual networks tend to be less controllable, difficult to brand while being less successful where high levels of trust are required. Virtual networks do support the combination of a wider range of available resources, are more cost effective and create visibility in the global marketplace.
- Hybrid networks represent a combination of the virtual and the physical network organization.

Closed or private networks as well as hybrid virtual networks have been observed to play the more important role in e-commerce (Lefebvre and Lefebvre, 2000). There are some considerations that impact on the viability of e-commerce

for existing enterprises. Conducting virtual organizing becomes increasingly difficult where the information exchange is critically important, where high levels of trust formation are required and with a high complexity of the transactions. Net organizations will opt for the physical network rather than the virtual network in such instances (Von Biedermann, 2004).

The need for a changeover of industries to e-commerce has an obvious impact on the traditional way business is conducted. Strader and Shaw (1997) highlight the important impact of e-markets on industry structure. The diffusion of electronic commerce in an industry impacts on the structure of the value chain that supplies the products or services to the final consumers. This can be linked to the disintermediating effect of information technology.

Various different approaches to the creation of competitive advantage within the virtual network of value chain members can be developed. It is important to first evaluate from what perspective, as a specialist in a particular industry, the web-based SME intends to create and develop a competitive advantage over its rivals. Hagel and Singer (1999) point out the potential competitive advantages of creativity, flexibility and speed that can be obtained in the global marketplace by specialists. According to them companies can be split into three types of businesses, namely:

1. The customer relationship business that builds, maintains and enhances learning relationships with customers, and identifies and anticipates their needs. This business is characterized by economies of scale. The target is the highest share of the customer's wallet.
2. The product innovation business is developing new offerings, i.e., products and services, and is launching them. These companies are characterised by speed of developing new innovations. The goal is to be faster than the competitor with launching outstanding new offerings.
3. The infrastructure business is providing the facilities to execute recurring tasks like manufacturing, logistics, storage, and communications. These

enterprises are also characterised by economies of scale. The aim is to work with large numbers and use the positive effects of economies of scale.

The main aim of each of the three business ‘types’, respectively, are scope, speed and scale.

Strader and Shaw (1997) explain the applications of e-commerce on modern business methodology as the potential and the need that exist with organizations, merchants and consumers to create cost savings while improving on the quality of goods and services, and increasing the speed of service delivery. They identify two phases that industry structures must go through when electronic markets diffuse across the industry. Figure 2.9 illustrates the phases in the transformation of the structure of an industry.

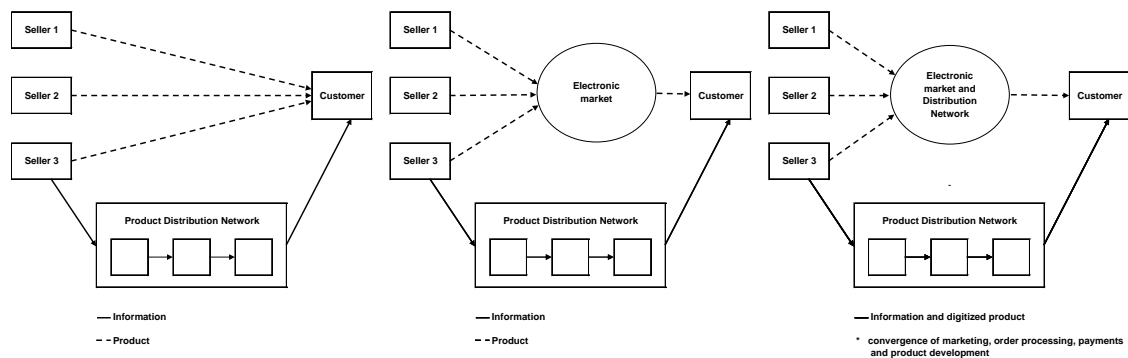


Figure 2.9. Phases in the transformation of the structure of an industry
(Source: Strader and Shaw, 1997)

In the traditional market the customer searches for information on the products available and considers aspects related to prices, quality and features. When the information has been analyzed, the consumer decides where to buy the product. The product is purchased and transported or delivered to the customer by means of a distribution network (Strader and Shaw, 1997). In this phase the goal is to provide a mechanism for reducing the search costs of products (money, time and

effort expended to gather product price, quality and feature information) for the consumers. The main advantage delivered in this phase is reduced prices through transparency obtained from widely available information as well as the elimination of intermediaries such as wholesalers from the value chain. The implementation of phase two in an industry suggests the creation of a new industry that provides access to electronic markets. The main aim in phase two should be to create and maintain a profit margin that is comparable to the traditional markets.

The second phase allows for the transformation of the structure of an industry with the digitization of the product itself as well as the distribution. Many advantages can be attained with the introduction of the second phase in an industry. Various seller and customer activities are neutralized that include marketing, order processing, distribution, payments and even product development processes that involve several separate firms. Digitized products are distributed electronically to the consumers thereby eliminating distribution costs. Costs and intermediaries may be diminished in such a process while other intermediaries and costs may need to be added to the value chain, since the main objective remains to gain benefits that outweigh the costs (Strader and Shaw, 1997).

The main objective with the coordination of value chain activities can be linked to the internet-based strategic objectives of web-based businesses in their endeavour to create some form of competitive advantage in e-commerce. Lumpkin *et al.* (2002) mention some important advantages and pitfalls with regards to internet-based strategies that the entrepreneur or network broker should consider because of its impact on coordination efforts within the virtual value chain. Aspects related to the strategic orientation of web-based businesses in order to create some form of competitive advantage in e-commerce will be discussed in more detail below in sub-section 2.4.2. Table 2.2 indicates various advantages and pitfalls that relate to the different internet-based strategies, mentioned by Lumpkin *et al.* (2002).

Table 2.2 Advantage and pitfalls of Internet-based strategies
(Source: Lumpkin *et al.*, 2002)

	Overall Cost Leader	Differentiation Strategy	Focus Strategy
Advantages	<p>Inventory reduction</p> <p>Increased buyer power</p> <p>More efficient delivery systems</p> <p>Improved warehouse management</p>	<p>Tailored customer management systems</p> <p>Ability for customers to customize – products and services</p>	<p>Limited market size discourages new entrants</p> <p>High specialization within specific market niche</p>
Disadvantages	<p>Channel conflict</p> <p>Higher threats from substitution and imitation</p> <p>Decreased information asymmetry makes comparison shopping easy</p> <p>Neglect of bricks-and-mortar business</p>	<p>Customers may find little value in customizable products and services</p> <p>Dilution of brand image or company reputation</p>	<p>Overextension of market niche encourages substitution and imitation</p> <p>Overly narrow market niche induces low demand for product or service</p>

The entrepreneur also needs to consider possible network strategies that can enhance the attainment of the business objectives through its e-commerce strategies. It is important to consider potential value chain members or network organizations that are not geographically bound and that are available to the entrepreneur in advancing its vision of future innovative value – creating products and services delivery. Many advantages can be attained when the entrepreneur opts to implement various and different strategies simultaneously apart from only the creation of value-producing nets. Moller *et al.* (2005) refer to Loeser (1999) in suggesting that such different network strategies can be divided as follows:

- Improving the operational efficiency of a strategic net
- Improving the leverage of existing capabilities through participating in one or several networks
- Developing new capabilities through innovation nets.

Moller *et al.* (2005) conclude that these strategies can be pursued by keeping existing strategic network positions, entering existing strategic networks or in creating and mobilizing new strategic networks.

This section concentrated on the role of the virtual value chain to enhance supply side activities in e-commerce. The next section focuses on the important role of the network broker or entrepreneur of the web-based organization in realizing the objectives of the business in e-commerce.

2.4 The critical importance of entrepreneurship in virtual networks

The creation of a virtual supply network which enables the entrepreneur to conduct e-business holds potential but is also problematic. Since local resources and competencies are not necessarily adequate or available, especially in developing countries, the entrepreneur need to build networks across regional divides to fill key knowledge and resource ‘gaps’ that might exist in the virtual value network. This section considers important aspects pertaining to the role of the entrepreneur in the virtual network. In sub-section 2.4.1, the important role of the entrepreneur in creating virtual networks is explored. Second, in sub-section 2.4.2, competitive value creation in virtual networks is discussed. Information management supporting virtual organizing in e-commerce is dealt with in sub-section 2.4.3 while the last sub-section considers trust formation in virtual networks.

2.4.1 The role of the entrepreneur in creating virtual networks

Katzy (1998) indicates that the new roles for designing virtual networks are described in the literature as ‘broker’, ‘entrepreneur’, or ‘promoter’. Miles and Snow (1992) identify three roles of the network broker that need to be performed during the life-cycle of the co-operation, namely to be the architect of the co-operation, the lead operator and the caretaker. Franke (1999) refers to Amit and Schoemaker (1993) in defining ‘entrepreneurship’ as the ‘processs of extracting

profits from new, unique, and valuable combinations of resources in an uncertain and ambiguous environment. Entrepreneurship can also be described as *'the creation of new enterprises'*. Amit and Schoemaker (1993) characterize the entrepreneur as *'the individual that innovates, identifies and creates business opportunities, and assembles and co-ordinates new combinations of resources so as to extract the most profit from their innovations in an uncertain environment'*.

The entrepreneur of the net organization always acts as the network broker with the implementation of the virtual network. The task of the entrepreneur to create a virtual network where existing networks do exist would be one of facilitation and promotion, but this is seldom the case. In sectors where limited networks exist the importance of the entrepreneur in creating successful new virtual networks increases.

Early writings on the virtual network de-emphasized the role of leadership in contributing to its effectiveness and efficiency (Jarvenpaa and Tanriverdi, 2002). The argument was simply that the virtual network has more capacity to deal with information and does not acknowledge the role that leadership can play. Shamir (2000) identified three possible views of leadership in virtual networks, namely, disposed, shared and virtual forms of leadership. Jarvenpaa and Tanriverdi (2002) describe the three perspectives as follows:

- The disposed view of leadership supports an increase in momentum of opportunity in real time where the leadership is transient, short-lived and distributed. The disposed view of leadership furthermore allows for a rapid shift in leadership, depending on who has the knowledge-advantage for a given task.
- The shared view of leadership suggests that the network structure is too complex for any central node(s) to perform the leadership function. All organizational members can assume some leadership role simultaneously or sequentially in this perspective.

- The virtual view of leadership includes a technology-centric approach, where communication and information systems define connections among the nodes of the network and influence how interactions and collaborations happen. In this perspective on leadership communication and information systems routinize production and work processes. Information technology thereby substitutes for certain aspects of leadership such as promoting participation.

The entrepreneur opting to implement a virtual network in order to reach his business objectives needs to shift his leadership practice from firm-centric to network-centric behaviour and thinking. This entails that leaders should balance the interests of the various stakeholders that form part of the value chain. The entrepreneur always seeks to enhance the virtual network's effectiveness and efficiency in order to realize its objectives. This entails that decisions taken by the entrepreneur might end up where it favours some members of the virtual value chain. This could lead to damaged relationships and the untimely departures of stakeholders with resources that are critical to the survival of the virtual network. Conflicts and unfavourable decisions are unavoidable and how they are communicated and justified directly affect the attainment of the high levels of trust needed in virtual networks. Entrepreneurs therefore need to develop a network perspective to each stakeholder claim in the virtual value chain (Jarvenpaa and Tanriverdi, 2002).

The entrepreneur also needs to manage the generation of ideas and the distribution of the profits generated from those ideas between the participants in the virtual value chain network. Jarvenpaa and Tanriverdi (2002) argue for a management perspective of shareholder value creation where shareholder value is maximized when the interests of all legitimate and non-legitimate stakeholders are acknowledged and developed in the virtual network. Entrepreneurs endeavour to optimize the collective relationships of all their stakeholders within knowledge-based virtual networks when they attempt to advance knowledge creation and exploitation. Creating and sustaining knowledge-based virtual

networks that are advantageous to all their stakeholders including employees, suppliers, and customers is not easily accomplished. Even when all the network participants are profitable individually the difference in profitability will create significant tension within the virtual network (Jarvenpaa and Tanriverdi, 2002). Jarvenpaa and Tanriverdi indicate that conflict between members of the virtual value chain related to the sharing of profits undermines high trust formation in virtual networks. This important aspect is discussed in more detail in sub-section 2.4.4. The creation of co-operative intra-and inter-organizational relationships in an environment of high trust is the responsibility of the entrepreneur.

The abovementioned discussion highlights two important concepts pertaining to the entrepreneur. The first one is also implicated by Franke (1999) in referring to Starr and MacMillan (1990) who emphasize the importance of social contracting for an entrepreneur when acquiring resources. They indicate the importance for entrepreneurs to use social assets, such as obligation, trust, gratitude, liking, and friendship to secure access to resources needed in the virtual network. Franke (1999) states “*social capital might well be the only input factor that the net-broker deliver to the virtual network*” and concludes that ‘*social contracting can be seen as his / her core competence*’ as the network broker in the virtual network. ‘*Social capital*’ as the most important contribution of the entrepreneur to the virtual network will never secure or cement its position in the virtual value chain nor, therefore, in the virtual network of SME’s. What is also important to realize is that all members in the virtual value chain need certain ‘*social capital*’ skills in order to function effectively in any virtual network. That brings the second important concept to the front. Entrepreneurs also need to increase their strategic position in the virtual network by nurturing and guiding the internal set of unique and essential capabilities that enhance the success of the virtual network (Chesbrough and Teece, 1996).

Pihkala *et al.* (1999) refer to Johannisson (1986) to explain the critical role of the entrepreneur by means of the personal networks approach to networking. The personal networks approach highlights the role of the entrepreneur as the main

actor responsible for implementing the virtual supply network of partners, resources and other institutions.

The creation of innovative value products or services suitable for the e-market place that e-customers are willing to pay for remains the responsibility of the entrepreneur. The next sub-section considers aspects pertaining to the interactive role of the entrepreneur in the creation of value offering in the e-marketplace.

2.4.2 Competitive value creation in virtual networks

The main objective for the entrepreneur of a web-based organization is to create economic value in the e-marketplace of users. The web-based entrepreneur implements a virtual supply network in order to leverage products, services and information delivery to achieve competitive advantage in the e-marketplace of users. Protecting its competitiveness and its market position against the impact of external challenges, entrepreneurs need to consider the five underlying external forces of competition namely suppliers' bargaining power, buyers' bargaining power, new market entrants and substitute products (Porter, 2001). These five forces are also linked to industry and structural attractiveness for web-based firms that participate in e-commerce. Web-based firms need to determine how the economic value created by any product, service, technology or way of competing is divided between the above forces of competition in a particular industry.

Porter (1985) identified three strategies that entrepreneurs of web-based organizations could implement to create competitive advantage in the global marketplace, namely, overall cost leadership, differentiation and focus. Porter's (1985) theory of the value chains indicates the importance of inter-organizational relationships (networking) for the web-based entrepreneur that implements a

virtual supply network of partners as the means to create and distribute value in the e-marketplace of users (Kinder, 2003).

Lumpkin *et al.* (2002) provide an interpretation of the Internet effects pertaining to the three identified strategic approaches of Porter in the creation of competitive advantage (see Table 2.3.) Table 2.3 indicates objectives to be achieved with each of the strategic approaches as well as possible innovative ways available to the entrepreneur to create value in the e-marketplace of users.

Table 2.3 Objectives and methods with strategic orientation
(Adapted from Lumpkin *et al.*, 2002)

	Cost-leadership strategy	Differentiation strategy	Focus strategy
Objective	To reduce value chain costs in a variety of innovative ways	To create opportunities for distinctive advantage created throughout the value chain	To combine and achieve advantage of cost-leadership and differentiation strategy throughout the value chain
Methods	<p>Web-based inventory control systems that reduce storage costs by providing real-time ordering and scheduling to manage demand more efficiently.</p> <p>Direct access to status reports and the ability for customers to check work-in-progress to minimize rework.</p> <p>On-line bidding and order processing to eliminate the need for sales calls and decrease sales force expenses.</p> <p>On-line purchase orders for paperless transactions to decrease costs of both the supplier and purchaser.</p>	<p>Internet-based knowledge management systems linking all parts of the organization to shorten customer response times.</p> <p>Real-time access to manufacturing operations status such as scheduling and delivery information to empower sales forces and channel partners.</p> <p>Personalized on-line access to provide customers with their own "site within a site" to track orders and process new orders.</p> <p>Rapid on-line responses to service requests and fast feedback to customer surveys and product promotion to</p>	<p>Permission-marketing techniques that narrow sales efforts to specific customers who opt to receive advertising notices.</p> <p>Chat rooms, discussion boards, and member functions for customers with common interests.</p> <p>Niche portals targeting specific groups with specialized interests.</p> <p>Streamlined browsing capabilities to focus customer search efforts within a specific domain.</p> <p>Virtual organizing and on-line "officing" to minimize infrastructure requirements.</p>



Collaborative design efforts to reduce the cost, efficiency, and cycle time of new product development.	improve marketing efforts.	Procurement efforts using techniques to match buyers with sellers.
On-line testing and evaluation of job applicants by human resource departments.	Access to real – time sales and service information to continually update research and development efforts.	
	Automated procurement and payment systems to provide suppliers and customers detailed status reports and purchasing histories.	

A business opportunity is considered to be any opportunity that potentially results in value for the company (Ojasalo, 2002). Ojasalo refers to Christie & Levary (1998) in suggesting that the identification of opportunities is a continuous process where opportunities emerge and disappear at a fast rate in a dynamic e-marketplace of users. He continues to explain that new opportunities may happen by *'systematically analyzing and predicting needs, problems, and different sources of value in the marketplace, in one's own organization, or in the internal or external value chain'*.

It is well established that completely new industries will evolve with the development of e-markets. Another feature of e-commerce is that it tends to be product-centred (Lefebvre and Lefebvre, 2000). They highlight how new and dynamic product offerings, new industries and new industrial structures put intense pressure on the web-based enterprise to effectively participate in e-markets through its dealings with consumers and value chain partners. In addition to these changes, the entrepreneur needs to consider security issues related to e-commerce where electronic data protection requires four levels of security namely confidentiality, integrity, authentication and non-repudiation (Lefebvre and Lefebvre, 2000).

Marshall *et al.* (2000) suggest that business opportunities tend to be too fleeting and transient in the global marketplace. They caution that virtual organizations tend to be opportunistic and avail themselves of profitable business circumstances even where the organization is only meant to exist temporary. They suggest that virtual networks have an *"acceptance of, even an enthusiasm for, change and uncertainty with respect to its products and services, its*

customer base, its structure and scope and in its very approach to doing business". The entrepreneur who implements virtual supply networks with the aim of creating sustainable competitive advantage therefore has to exercise caution when taking advantage of emerging opportunities.

Creating competitive advantage with product offerings might not be enough to secure sustainable competitiveness. The entrepreneur of a net organization needs to consider different approaches to create competitive advantage such as new innovative approaches to information management. This is discussed next.

2.4.3 Information management supporting virtual organizing in e-commerce

With the revolutionary growth of the Internet and the value of information exponentially increasing, information has become as important as products and services in e-commerce. Rapid and consistent changes impact on new innovative products offerings in e-commerce such as '*digitized products*', with a corresponding shift from physical content to information content (Hagel and Singer, 1999). The virtual network with its network structure enables a flat '*web-like*' organization that supports knowledge flows among all firms participating in the value chain (Jarvenpaa and Tanriverdi, 2002). They also note how the locus of working, learning and innovation shifts from structures inside the firm to a virtual information network. The extent of the network organization's internal and external information networks determines its ability to obtain and leverage information (Jarvenpaa and Tanriverdi, 2002). They indicate that the external information network includes customers, suppliers, partners and other

stakeholders in the net organization's value chain, a fact which has a direct impact on its knowledge capability (Bhatt and Emdad, 2001).

Information exchange between the customers and suppliers enhances the potential of the value chain to not only create and develop customer value but to improve the competitive advantage of the virtual network in e-commerce.

Bhatt and Emdad (2001) explain the potential of information shared between partners in a virtual network to transform value-added services throughout the virtual value chain. This model is illustrated in Figure 2.10.

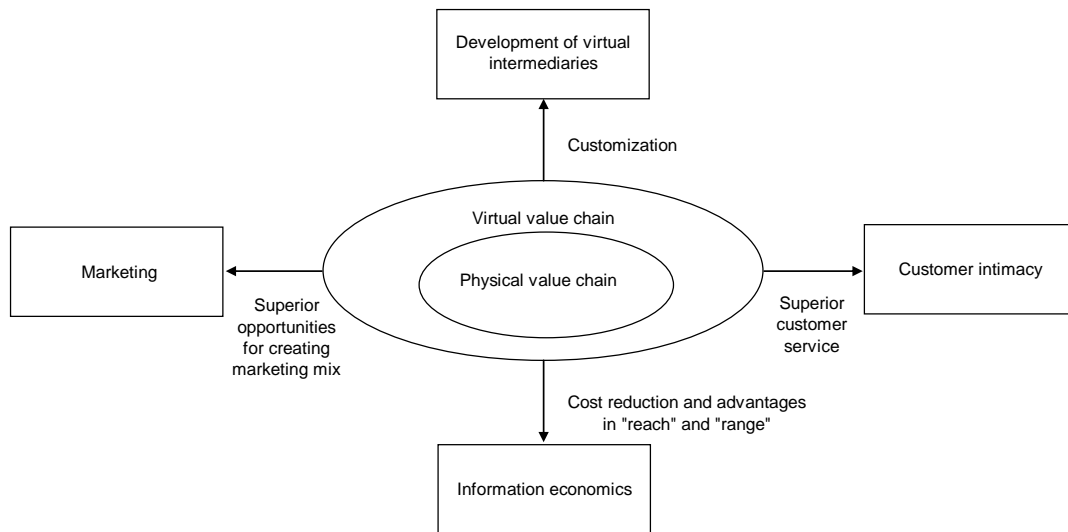


Figure 2.10. Transformation of value-added services through the virtual value chain. (Source: Bhatt and Emdad, 2001)

The virtual value chain, because of information economics, impacts on the virtual network and its success in e-commerce. Information becomes strategic within the virtual value chain where the virtual networks have the advantage of 'reach' and 'range' in collecting, organizing and analyzing activities pertaining to the virtual

value chain. The virtual value chain impact on the four p's of marketing as follows:

- Product: Customized options are provided to customers and product and service offerings are enhanced with additional information about the products and services.
- Place: Subscription and distribution handled in real time while value chain activities are limited by means of the Internet. The virtual value chain activities can be performed in real time without limitations of distance with 'digitized products'.
- Price: different prize options are offered on products and services to customers. Information freely available to customers in order to determine value of add-on features, thereby enabling customization at an additional cost.
- Promotion: Virtual networks can build a store-front in order to advertise its products and services that can be ordered online.

E-commerce customers are more willing to share information after a transaction has been completed successfully, and this enables the entrepreneur to provide superior customer service throughout the virtual value chain, creating the potential to build long-term relationships (Kotha, 1998). To achieve this, the entrepreneur needs to excel at information management in order to strengthen and develop the virtual value network of partners that include both the virtual supply network of partners and the users in the e-marketplace.

This does not simply imply that the entrepreneur should excel at technically exploiting information management. Panteli and Sockalingham (2004) discuss the fundamental shift in emergent information management from being techno-centric to acknowledging the value of people, connectivity and social dynamics. They thereby acknowledge the thinking of McElroy (2003) who states: "*Unlike first-generation knowledge management, in which technology always seems to provide the answer, second-generation thinking is more inclusive of people,*

process and social initiatives". Panteli and Sockalingham consider learning, knowledge sharing and knowledge creation as social processes in which relationships are central for effective knowledge sharing and knowledge creation. The importance of knowledge sharing in the virtual network of an organization is clearly of vital importance in reaching its objectives in e-commerce.

Jagers *et al.* (1998) argue that an absence of information, information sharing and knowledge leads to a lack of control and uncertainty with regard to virtual network membership. Their model is shown in Figure 2.11 below.

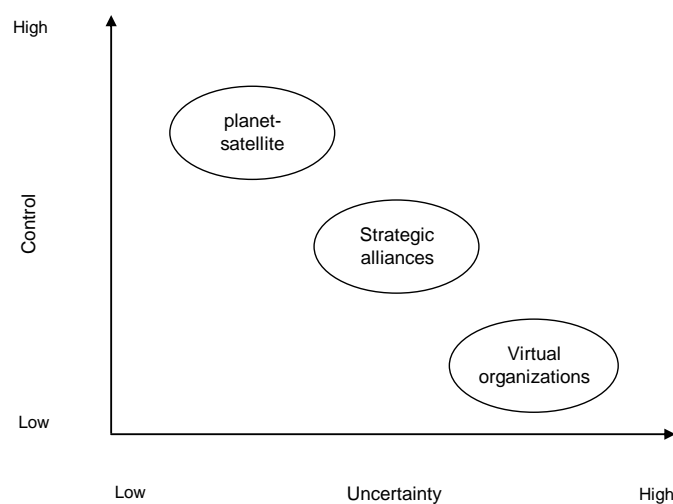


Figure 2.11 Continuum of network organizations
(Source: Jagers *et al.*, 1998)

Figure 2.11 indicates how information and information management have the ability to minimize uncertainty and to optimize better control in the virtual value network of partners. Control in the virtual structured network is obtained by pooling the information flow between virtual value network partners rather than membership in a virtual value network of partners.

Information sharing in a virtual network is inextricably bound to trust between the members of the virtual network. Panteli and Sockalingam (2004) indicate that a trusting environment limits opportunistic behaviour while members of the value chain are more confident that the information shared will be used to the

advantage and advancement of the alliance. They also refer to Davenport and Prusak (1998) who stated that “*trust is at the heart of knowledge exchange*”. The entrepreneur therefore needs to advance the open sharing of confidential information that sustains further trust formation (Gallivan & Depledge, 2003). A one one-sided information flow to the entrepreneur intended to monitor other partners in a virtual supply network may lead to low levels of trust (Gallivan & Depledge, 2003).

The important role of trust in the virtual network of value chain organizations or members is considered in detail in the next sub-section.

2.4.4 Trust formation in virtual networks

Gallivan and Depledge (2003) define trust as ‘*a willingness to make oneself vulnerable to potential harm from another party*’. Based on the literature and for purposes of this discussion trust is considered to be ‘*a willingness to seek and nurture selective opportunities to reach out to others with the intention to create a potential mutually advantageous experience*’.

Jarvenpaa and Tanriverdi (2002) indicate that where trust is not present the virtual network structure tends to disintegrate. Trust impacts upon and is considered to be important in the development of interorganizational relationships (coordination activities) between virtual value chain members (Bunduchi, 2005). To fill in the ‘*voids of trust*’ that exists represents the most important aspect of leadership for the entrepreneur in a virtual knowledge networks of partners.

Jarvenpaa and Tanriverdi (2002) motivate the importance of trust in virtual networks as follows:

- Virtual knowledge networks are synonymous with uncertainty and are enabled as well as limited by information technology. Conflict is often found in such settings. Uncertainty caused by unprecedented changes in the environment necessitates high levels of trust with regard to intra- and

- inter-organizational relationships. Such rapid changes are typically caused by rapid transformation of industries, globalization and new technologies.
- Many different stakeholders with differing motivations form part of a virtual knowledge network. Conflict caused by individual interests will follow when conditions and opportunities change. Where high levels of potential for conflict exist leaders are forced to focus on building trust. Trust is considered to be instrumental in avoiding or managing conflicts, settling disputes, and sustaining relationships with employees, customers, or suppliers faced with possible unfavourable outcomes at any given time. Jarvenpaa and Tanriverdi (2002) note the important fact, namely how *'trust reduces the likelihood that other parties will behave opportunistically at times of conflict by introducing social obligations external to the particular transaction'*. This is also referred to as 'social capital' and seems to accumulate in times where a trusting relationship seems to exist.
 - Information technology is not only the enabler but also limits its potential. Computer-mediated communication and information technology limits trust-building opportunities in the value chain. The fact that virtualization allows for time compressed project windows is not supportive to the development of deep social relationships. Communication established through purely virtual means is not supportive in strengthening social relationships and might even decay in time.

Trust has a direct impact on the success of the entrepreneur of a web-based organization, implementing a virtual network of partners to compete in the global e-marketplace (Ibbott & O'Keefe, 2004; Ratnasingam, 2004; Pavlou, 2002). It is important to consider the various manifestations of this impact.

The creation of trust implicates the need to cultivate additional trust-seeking processes in the network development which also is time consuming (Pihkala *et al.*, 1999). Trust formation is particularly difficult to attain with the virtual value chain of partners that represents a special case of networking where the roles of

formality, flexibility, division of work, competition and opportunism take a more dynamic form. Since the virtual firm constitutes an organization of regionally dispersed value chain members, the virtual network of partners needs to maintain its nature as a distinct organization, which is problematic. Trust is the 'glue' needed to distinguish the virtual network as a particular, independent system. This is to be expected in an environment where partners share their skills, expertise, resources and competencies to the benefit of all members of the virtual value network. Pihkala *et al.* (1999) mentions that according to networking theory '*building a web of trust and shared understanding*', is an ideal organizing model. He also notes the importance of trust for the entrepreneur of a virtual network and states "*Since the networking system may include participants who actually do not know each other, the expertise and reputation of the broker as the central actor in the network building has to reflect the trustworthiness of the whole system*". He concludes that in this way participants of virtual organizations will be able to have some degree of trust in each other on account of their membership in the network.

Some researchers indicate that familiarity is a prerequisite for trust development between value chain members (Panteli and Sockalingam, 2002). This is not always viable within the virtual organization setting as explained by Pikhala (1999). Although technology is not sufficient in itself in promoting collaboration between value chain members (Baba, 1999), alternative arrangements may need to be implemented to enhance trust formation. Panteli and Sockalingam (2002) refer to Zack (1993) in suggesting face-to-face communication as the preferred means of communications at the start and end of each work process in promoting real shared understanding of task requirements and joint achievements. They indicate that technology-mediated communication is more suited to the middle period when the task context is well established. This again highlights the important role of the entrepreneur in developing trust in the virtual organization, since he/she would have to facilitate such face-to-face communication.

Trust can be defined as a state of a positive, confident though subjective expectation regarding the behaviour of somebody or something in a situation

which entails risk to the trusting party (Currall and Judge, 1995). Dikken (2000) acknowledges that individuals have a natural tendency to trust others although only in certain situations and under specific conditions. This is referred to as situational trust that is dependent on situational cues that impacts the expression of generalised tendencies to trust (Jones and George, 1998).

Conditional trust is found in the initial phases of relationships where no reasons for distrust as yet exists (Jones and George, 1998). Conditional trust may develop into unconditional trust as relationships mature and familiarity increases. Unconditional trust is supportive of synergistic relationships essential for superior performance typical of the one party having founded knowledge, experience and confidence in the other party (Newell and Swan, 2000). Panteli and Sockalingam (2004) refer to Lewicke and Bunker (1995, 1996) in recognizing aspects of trust that are dynamic and distinct in character in different stages of a relationship. They suggest that *“the essence of trust cannot be captured in a single, ‘static’ definition of its key elements and attributes”*.

Trust is therefore considered to adopt a different character in the early, developing and mature stages of a relationship. This viewpoint is considered to apply to virtual organizations, and allows for three classifications and stages of trust, namely, calculus-based trust (CBT), knowledge-based trust (KBT) and identification-based trust (IBT). The achievement of trust at one level enables the development of trust at the next level. The stages of trust development are illustrated in Figure 2.12.

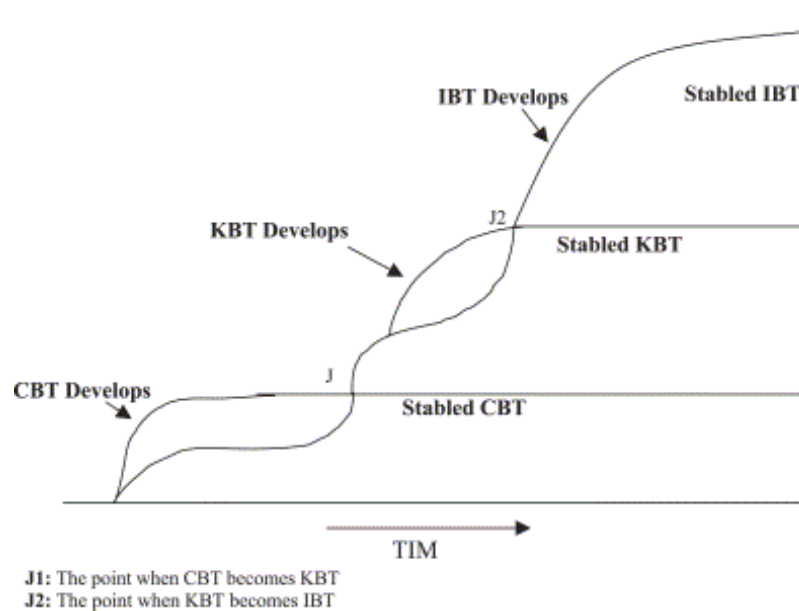


Figure 2.12 The stages of trust development
(Source: Panteli and Sockalingam, 2004)

'*CBT*' relates to rewards to be derived from pursuing and preserving a relationship and fostering only limited levels of knowledge sharing necessary to fulfil the expectations of trustworthy behaviour. '*KBT*' suggests stronger trust formation and is more reliant on information and more specifically, a higher level of information sharing, where other members of the value chain are the source, and is developed through interactions over time. '*IBT*' allows for mutual understanding between the various parties where members of the value chain act on each other's behalf. *IBT* supports partners in developing a shared identity with strong inter-relationships that facilitates value-adding knowledge sharing.

Jarvenpaa and Tanriverdi (2002) indicate that although virtual networks might be effective and efficient structures for handling complex information, they tend to be '*weak structures*' for managing and providing support for social relationships in the network. The temporariness of a virtual network arrangement is not supportive of trust formation either. Trust becomes important when more than arm length transactions are required, such as shared vision and collaborative relationships in virtual networks. Meyerson *et al.* (1996) highlight the concept of

'*swift trust*' as important in relation to temporary work arrangements such as virtual networks. They suggest that swift trust might be strong and '*resilient*' enough to survive the life of the temporary group as it is founded upon the competent and faithful enactment of clear roles and members' associated duties. If some form of trust is not realized in the virtual network various negative results can be realized where weak trust exist such as '*hit and run*' behaviour by the value chain members as well as distrust in one part of the network connection spreading to other parts of the network. Panteli and Sockalingam (2004) consider '*swift trust*' to be sufficient for the needs of virtual networks as long as the roles of the members of the value chain are well defined with sufficient acknowledgement of other members' roles and responsibilities.

The reality and potential important role of conflict in organizations such as virtual networks is recognized by researchers (Panteli and Sochalingam, 2004; Gallivan & Depledge, 2003; Jarvenpaa and Tanriverdi, 2002). Panteli and Sochalingam (2004) identified three forms of conflict, namely, relationship or affective conflict, task or cognitive conflict and process conflict. '*Relationship conflict*' relates to inter-personal incompatibilities and can diminish trust and weaken relationships that impact on value-adding knowledge sharing and knowledge creation. '*Task conflict*' is task oriented and impacts on divergent thinking necessary for improved responsiveness to external change. '*Process conflict*' relates to aspects of how the accomplishment of tasks should proceed and potentially provides the foundation for relationships and trust between partners to develop. Panteli and Sockalingam (2004) propose a framework for understanding trust and conflict over time, based on the above definitions of conflict and the trust development model of Lewicki and Bunker (1995, 1996). This framework is illustrated in Figure 2.13.

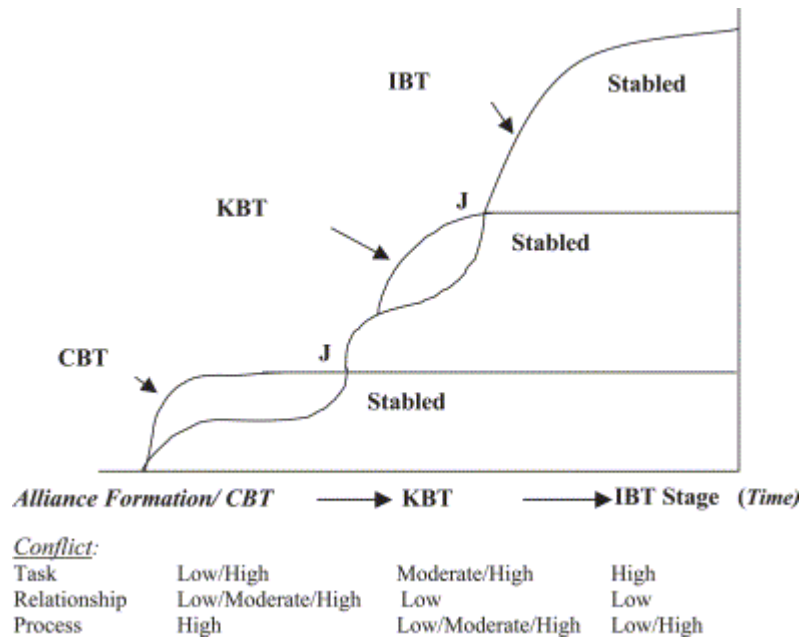


Figure 2.13 Conflict propensity and trust development in virtual alliances – a generic framework (Source: Panteli and Sockalingam, 2004)

Panteli and Sockalingam integrated the three models of virtual inter-organizational arrangements as developed by Burn *et al.* (2002), namely, star-alliance, value-alliance and co-alliance with the above model. This forms the basis for considering the features of and the potential trust and conflict dynamics for each of these three models as shown in Table 2.4.

Table 2.4 Trust and conflict in virtual alliances (Source: Panteli and Sockalingam, 2004)

	Star-alliance	Value-alliance	Co-alliance
Nature	Single dominant party for task allocation	Single dominant party for process coordination	All parties share equal status and responsibility
Dominant Knowledge	Explicit	Explicit	Tacit and Explicit
Type Transferred	CBT to KBT	CBT to KBT	CBT to KBT to IBT
Trust Development			
Trust and Conflict: Dynamics and Development			
-CBT	Low-Task Conflict Low Relationship Conflict (but	Low-Task Conflict Low Relationship Conflict (but	High-Task Conflict Low Relationship Conflict

	has potential to escalate to Moderate/ High:	has potential to escalate to Moderate/ High)	(but has potential to escalate to Moderate/ High)
-KBT	High Process Conflict	High Process Conflict	High Process Conflict
	Moderate Task Conflict	Moderate Task Conflict	High-Task Conflict
	Low Relationship Conflict	Low Relationship Conflict	Low Relationship Conflict
	Low/ Moderate Process Conflict	Low/ Moderate Process Conflict	Low/ High Process Conflict
-IBT	N/A	N/A	
	N/A	N/A	High-Task Conflict
	N/A	N/A	Low RC
			Low/ High Process conflict

Various researchers highlight the importance and the role of the strategic core and consider it to be central to managing the virtual organization (Miles and Snow, 1992, Jarillo, 1993). Miles and Snow (1992) indicate that the task of the central firm, the entrepreneur, is to create a sense of trust and reciprocity in the system. Trust can be a potential source of competitive advantage (Barney and Hansen, 1994) where not only the entrepreneur but all members of the value chain need to contribute to the necessary trust formation. As indicated in the previous section, the entrepreneur is responsible for trust formation in the virtual network necessary to create a trusting environment that enables effective and efficient information management. Factors and processes that play an important role in building trust have been discussed in this subsection.

It is clear from the discussions in the various sub-sections of this section that the entrepreneur plays a critically important role in virtual networks. The entrepreneur is instrumental in the formulating of value offerings, and has the responsibility for information management, while the creation of trust in the virtual network, crucial to its success, starts with him. All relevant responsibilities of the entrepreneur can be linked to strong socio-technical skills. Such '*socio-techno*' skills are independent of the entrepreneur's specific function in the virtual value chain and are related to his role as network broker in the virtual value chain. The skills or capabilities needed by the entrepreneur to create and manage a virtual network in order to reach its business objectives are discussed next in Section 2.5.

2.5 The role of networking capabilities with virtual organizing

As discussed in Section 2.2, a new movement of emerging entrepreneurs participate in e-commerce by means of virtual supply networks of firms thereby replacing hierarchically structured vertically integrated firms in the global e-marketplace. Various uncertainties that exist with regards to virtual organizing of virtual networks of organizations hinder its potential to be implemented by entrepreneurs of web-based businesses. Sjostrand (2000) explain that *'the notion of network organizing is activities that are transgressing the border of the formal organization'*. He furthermore states that *'we seem to lack complete and concrete theories for how to coordinate and control actions that exceed the notion of the institutionalized formal organization'*. Although the advantages of virtual organizing of virtual networks are well defined in the literature, it is not clear how entrepreneurs manage, control and coordinate the virtual value network. Other concerns highlighted in academic discussions relate to what networking capabilities support the entrepreneur and enable virtual organizing of virtual network configurations.

The ability to successfully implement virtual organizing is related to the personal characteristics of the entrepreneur and to gain more insight into networking capabilities it is important to understand the social, technical and socio-technical processes that are associated with virtual organizing of virtual networks of companies. This is undertaken in Section 2.5.3. The first sub-section considers the importance of internal capabilities in strategic business networks. The next sub-section considers internal management capabilities of strategic business networks as important considerations for inclusion in the virtual supply network of the entrepreneur. The third sub-section considers aspects of networking capabilities that enable virtual organizing activities between partners (external view) and that have not been discussed in Chapter One.

2.5.1 Internal capabilities in strategic business networks

Entrepreneurs need to gain experience in order to successfully create, develop and manage a virtual supply network of partners in the e-marketplace (Larsson *et al.*, 1998). Members of a virtual supply network contribute resources, capabilities, and expertise necessary to deliver products and services to the users. Resources, capabilities and expertise that participants contribute in the virtual supply network are individual and organization-based that impact on the internal activities of the organizations of the virtual supply network (internal view). Pihkala *et al.* (1999) describe capabilities as *'the information-based organizational processes that are firm-specific, and that are often intermediate goods'*. Members of the virtual supply network implement capabilities that enable better use of their internal resources (Pihkala *et al.*, 1999) whereas *'speciality'* indicates the individual input when combining the resources in such a way that it delivers competitive advantage in the e-marketplace.

It is important to distinguish between capabilities (internal view) and networking capabilities (external view) for purposes of future discussions. *'Capabilities'* indicate skills pertaining to an organization or partner of a virtual supply network that impact on its ability to make a contribution in the product delivery in the e-marketplace of users (internal view). *'Network capabilities'* implicate specialized core competencies of an organization or partner that impact on its ability to participate in the virtual coordination activities of the virtual supply network of partners (external view).

The virtual supply network of partners needs to excel at different internal capabilities based on the form of network that is implemented by the entrepreneur. Moller *et al.* (2005) highlight the need for a different set of capabilities that enables a value system to function pertaining to each of the forms of strategic networks. This concept is illustrated in Figure 2.13.

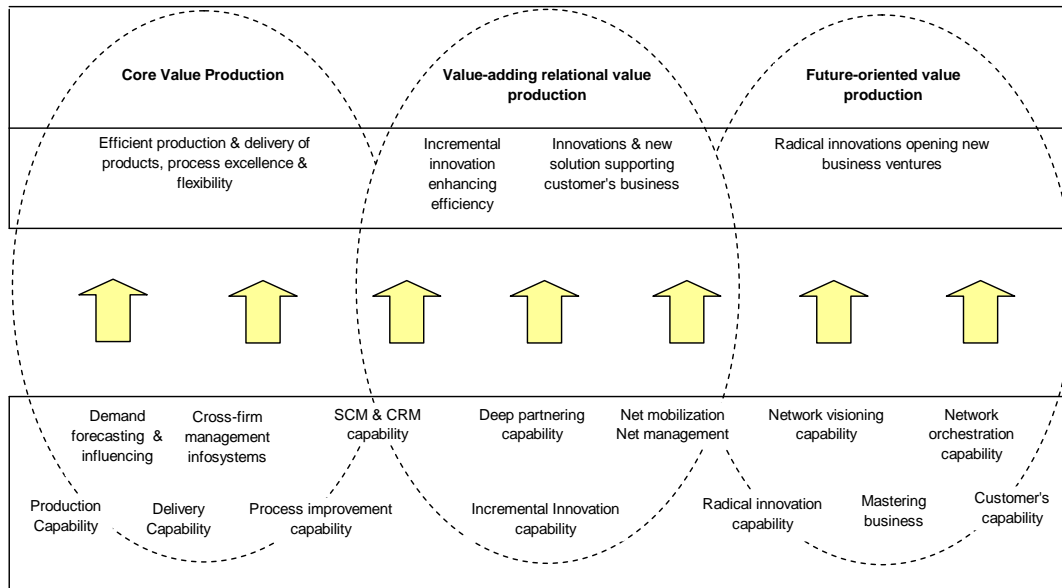


Figure 2.14 Value-system continuum with example networks
(Source: Moller *et al.* 2005)

Strategic networks can be identified as a continuum of value systems extending from fully determined systems to emerging systems. In identifying the characteristics of the underlying value system, as indicated in Figure 2.13, a specific strategic network may be positioned on a theoretical continuum. Three considerations have been identified (Moller *et al.*, 2005) which relate to value production and the capabilities needed with value production, namely, core value production, value-adding relational production and future-oriented value production. Each of the three value systems of a virtual supply network therefore implies that the organization or partner needs to excel at a different set of capabilities.

Figure 2.13 indicates five forms of strategic business networks, namely, supplier networks, distribution networks, technology development or R&D networks, competitive coalitions and technology coalitions. Alternative objectives need to be determined for each of the identified strategic networks, including an attempt to increase the functional and operational efficiency of an existing value system as

is the case with tiered supplier nets and ECR (Electronic Customer Relationship) arrangements, the development of better products or systems through an R & D net, or the development of completely new business concepts requiring partly new value activities or even a new value system. The value system and its level of determination supports the entrepreneur to set the internal demands expected from participating virtual supply network partners.

The three identified value systems in Figure 2.13 impact on the internal capabilities that a partner needs to develop and implement. The left end of the three ideal value-systems relates to relatively stable systems. Actors in this setting produce and deliver specific products and their value activities and capabilities are known. The other end of the continuum refers to emerging value systems of virtual supply networks. The objective for the entrepreneur in this setting is to create networks where new technologies, products or business concepts can be developed and commercialized. Future oriented strategic networks might involve radical modifications to existing value systems as well as the creation of new value activities. Internet portals and emerging mobile services are examples of products and services delivered in e-markets. The emerging value systems involve dynamic and complex learning processes while inter-organizational relationship formation cannot be specified in advance. The middle of the continuum relates to value systems that are well defined but are in need of incremental and local improvements such as business-process modifications.

Each of the three defined value systems highlight different 'internal' capabilities as important considerations for successful participation in the virtual supply network of partners. Moller *et al.* (2005) note that the ability to produce core value in already existing vertical networks is considered a necessity before venturing into the development of incremental innovations through virtual supply network members. Such a platform that is effective in creating incremental innovations production will support more radical innovations to be developed through the future-oriented strategic networks. The management capabilities (internal view) associated with this model will be discussed in more detail in Section 2.5.2.

2.5.2 The contribution of capabilities in a virtual supply network

Compared to a hierarchically structured organization, a virtual supply network demands different internal capabilities and considerations for participation. The development of these internal capabilities supports the activities of the organization as the means to improve on and effectively exploit the resources needed to deliver e-commerce oriented products in the e-marketplace.

Moller *et al.* (2005) developed a model to describe the capabilities needed in managing strategic networks. The capabilities are divided in two groups that relate to more traditional business competencies and the capabilities needed in managing strategic relationships and virtual supply networks. Table 2.6 illustrates the identified management capabilities in relation to value production.

Table 2.5 Management capabilities needed with value production
(Adapted from Moller *et al.* , 2005)

Value creation		Management capabilities needed in virtual networks	Management capabilities needed in hierarchical organization
Core value production	Efficient production & delivery of products, process excellence & flexibility	Demand forecasting & influencing Cross-firm management infosystems Delivery capability Supply chain management & customer relations management capability	Production capability Delivery capability Process improvement capability
Value-adding relational value production	Incremental innovation enhancing efficiency Innovations & new solution supporting customer's business	Supply chain management & customer relations management capability Deep partnering capability	Incremental innovation capability

		Net mobilization	
		Net management	
Future-oriented value production	Radical innovations opening new business opportunities	Network visioning capability	Radical innovation capability
		Network orchestration capability	Mastering customer's business capability

Moller *et al.* point out that complexities related to an existing value-system impact on the number of actors involved as well as on the intensity of actor relationships and result in the required set of capabilities becoming more multifaceted. The role of the entrepreneur is of vital importance and includes his ability to envisage the development of the business field in question, to identify and evaluate potential network partners and to develop an attractive agenda for the network. Moreover, it is important that the entrepreneur present the web-based organization as a competent participant in the e-marketplace that is able to acquire and mobilize the resources and knowledge needed to seize opportunities as they become available in e-commerce.

The entrepreneur therefore needs to present himself as a mobilizer that is able to select autonomous partners and influence the resulting virtual supply network needed for success in the e-marketplace of users. He is responsible for creating an organizational forum for sharing the work and responsibilities of the actors and takes responsibility for creating coordination mechanisms to enable net coordination. Moller *et al.* (2005) refer to Nonaka and Takeuchi (1995) when stating that entrepreneurs should have the ability to foster the learning environments necessary to explicate and to combine tacit knowledge and the sharing of knowledge.

The focus of the above discussion was internal – on the networking capabilities needed to constitute a virtual network of partners and to support its ongoing growth. The next sub-section takes an external view and considers aspects of networking capabilities that impact on inter-organizational relationships in virtual networks.

2.5.3 Networking capabilities in inter-organizational relations

This sub-section considers various aspects of the findings and ideas of Pihkala *et al.* (1999) on the importance and need of networking capabilities that have not yet been dealt with. The importance of networking capabilities for virtual organizing in a virtual value network of partners, from an inter-organizational viewpoint, can be summarized as follows:

The resource-based approach is the starting point for the need to implement networking capabilities with virtual organizing in a virtual supply network of partners. The resource strategy implicates that resources and capabilities, in combination, may result in strategic assets that form a base for sustainable strategic advantage for web-based organizations in the global e-marketplace. Following the logic of the resource-based approach, highly specialized and transferable resources are valuable for a networking firm, but cannot be put into full use without the capability of networking. Pikhala *et al.* (1999) state the following: “*The nature of networking capability as an action-based capacity of an individual entrepreneur or an organization to extra-organizational activities may result in self-incurring tendencies: that is, those without adequate level of networking capability do not attempt to be included in networking, while those high in networking capability increase their commitment in networking due to their prior positive experiences*”. They define the term ‘*networking capability*’ as ‘*an action-based capacity of an individual or an organization to extra-organizational activities needed to transform resources into profitable use*’.

Pihkala *et al.* indicate that the network organizational construct favours SME’s in the e-marketplace of users. It is important to consider which type of small and medium sized organizations can benefit from implementing virtual networks of organizations that implement virtual organizing. Applying a resource-based view, Pihkala *et al.* argue that only SME’s with a competitive advantage can benefit

from virtual networks. A framework categorizing SME's based on resource-base considerations as well as networking capabilities highlights important factors impacting on SME's potential to effectively participate in a virtual network of organizations. This is illustrated in Figure 2.15.

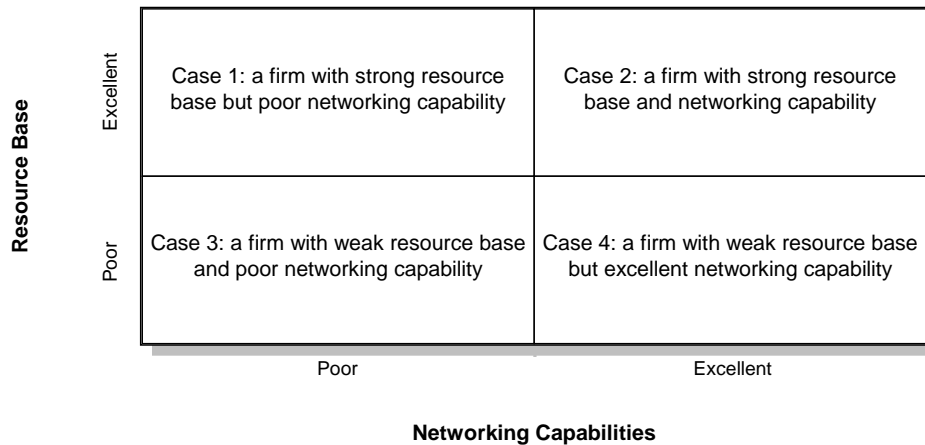


Figure 2.15 A framework for the analysis of network development
(Source: Pikhala *et al.*, 1999)

Case three represents firms with weak resources and weak networking capabilities. In situations where such a company have access to highly skilled and specialized expertise, it might benefit in offering its expertise to other companies.

Case four identifies a firm relying on networking capabilities. Case four represents firms that might not have a strong presence in the global marketplace and will battle to find strong partners willing to participate in a strategic network.

Case two considers the firm with both highly qualified technical know-how and well-developed networking capabilities necessary to form co-operative relationships with other partners in the networks.

Case one indicates a firm with a strong resource base that can improve its competitiveness by developing strong networking capabilities.

Pihkala et al. (1999) note how networking capabilities should not only include the ability to employ competencies of organizations with the necessary resources but should furthermore include abilities needed throughout the whole lifespan of the network organization. It is also important to recognize that networking capabilities relate to both organizational as well as entrepreneurial characteristics. Networking capabilities as organizational skills relate to the capability of the organization to network. Networking capabilities as entrepreneurial skills relate very much to the entrepreneurial behaviour that has been characterised as 'acting as if' (Gartner et al., 1992). Pihkala et al. (1999) describe 'acting as if' as an entrepreneur that has to look for backup from his network since he does not possess all the resources or the capability needed to fulfil the customer's needs. Thus business opportunities can materialize into network-oriented business where entrepreneurial and organizational networking capabilities become valuable, if not value-adding, elements of the network chain of partners (Pihkala et al., 1999).

The role played by social skills pertaining to the network broker, is to facilitate the formation of information networks within the virtual network of organizations. The creation of an information network is crucial to successful participation in e-commerce. This type of structural setting places a high premium on social and relational capabilities on all the members of the value chain.

The entrepreneur also plays a prominent role in the creation and maintenance of key social relationships within the virtual networks of value chain members (Jarvenpaa and Tanriverdi, 2002). They state the following: "*The leader's role shifts from providing strategic decision making to harnessing key social relationships within the core and at the periphery of the network*". We define this leader to be the entrepreneur or network broker responsible for strategic decision making that relates to the product or service offering in the e-marketplace. Jarvenpaa and Tanriverdi (2002) relate networking capabilities to the increase in the organic nature of the virtual network structure and its potential or ability to process complex, ambiguous information. These capabilities are not linked to specific technical management activities in the virtual supply network but are

related to skills of individuals in their personal capacity to enable and sustain virtual organizing.

Any sector of existing industries where specialized resources are of crucial importance in the value chain that is owned by different but geographically dispersed firms lends itself to virtual organizing of a virtual network of companies. It is through the virtual supply network of companies with its contributions of needed resources and capabilities that the entrepreneur can realize his vision when *'acting as if'* in front of the customer in the e-market place.

2.5.4 The literature review on networking capabilities

The literature review established networking capabilities to be used in virtual organizing as the central focus and motivation for developing the preliminary framework. The difficulties entrepreneurs experience to establish and build inter-relationships in the virtual value network highlights the importance of networking capabilities used in virtual organizing. The literature review delivered numerous quotations from academic papers that indicate the importance of networking capabilities used with virtual organizing in virtual value network of partners. This is underlined by the following quotations from academic papers:

"Thus, instead of firm-specific competencies, the primary value-adding element of a virtual organization is the joint capability by means of which partners together change competencies into profitable operation" (Amit and Shoemaker, 1993).

"Recently, it has been argued that, relational and social-context factors should be taken into account to explain the influence of ICT on inter-organizational relationships" (Christiaanse, Van Diepen and Damsgaard, 2004).

"The virtual organization creates new management and coordination challenges" (Lucas and Baroudi, 1994).

"Management's challenge is to continually adapt the organizational and technological capabilities to be in dynamic alignment with the chosen business vision" (Venkatraman, 1994).

“The network will, in many instances, serve as the market. When this occurs, market structure will depend as much on network capabilities and the economies of networks as it does on relationships among firms” (Benjamin and Wigand, 1995).

“The new network enterprise is a phenomenon comprising not only shifting internal hierarchies, but also changing patterns of competition and cooperation across institutions. That specific form of enterprise whose system of means is constituted by the interaction of autonomous systems of goals” (Castells, 1996).

“A virtual organization is the latest challenge and opportunity for small and medium-sized firms, which often have difficulties in competing as single units without specialized resources and capabilities” (Pihkala et al., 1999).

“Highly specialized and transferable resources are valuable for a networking firm, but cannot be put into full use without the capability of networking” (Pihkala et al., 1999).

“The resource-based view of the firm sees firms as basically heterogeneous regarding both their resources and capabilities. The virtual organization has emerged to create flexibility and efficiency, i.e. better exploitation of resources and development of capabilities within groups of organizations” (Pihkala et al., 1999).

“As international experience increase, the learning loop is concerned with developing capability and ‘systems’ in international business” (Fletcher, 2000).

“An emergent issue here is, not so much whether information and communications technologies’ could support the network organization, but whether we can dictate or control its use” (Gillian, 2000).

“Yet, even the most adaptive organizational structures can challenge an organization’s social and relational capabilities” (Jarvenpaa & Tanriverdi, 2002).

“Although virtual networks can be “strong structures” for handling complex information, they are frequently “weak structures” for managing and providing support for social relationships in the network. Yet, virtual networks critically

depend on the quality of those social relationships” (Jarvenpaa & Tanriverdi, 2002).

“Electronic networks and virtual organizing capabilities are shaping the competitive performance of small firms in the global information economy” (Tetteh & Burn, 2001).

“One solution is to apply a perpetual strategy process...such a strategy should be resource-based emphasising distinctive, firm-specific and hard to copy assets, skills and knowledge” (Hackney et al., 2002).

Aspects of networking capabilities that enable coordination activities in the virtual network of partners have not been satisfactorily explained in the literature. Networking capabilities enable the coordination activities of all the partners in the virtual network of the entrepreneur and enhance the potential for successful participation in e-commerce. Networking capabilities are personal skills of a social-technical nature, and these, as well as the ability and knowledge to effectively exploit opportunities in e-commerce, enable the entrepreneur to manage the coordination activities of the web-based organization.

The preliminary framework that will be developed in Chapter Four aims to improve our understanding of the role of networking capabilities.

2.6 Summary

This chapter provided a detailed exposition of the complexities related to the implementation of virtual organizing in the global e-marketplace. The conditions and new emerging industries in the e-marketplace favour web-based organizations that implement virtual organizing. Chapter Two focused on the need for networking capabilities to implement virtual organizing in the global marketplace. It is clear from the discussion that more research is needed on how

networking capabilities enable effective virtual organizing in a virtual network of organizations.

The main proposition of this thesis is that networking capabilities enable effective and efficient virtual organizing of value chain members in the e-marketplace, and the objective is to identify the most important networking capabilities and to understand how they contribute to such virtual organizing. Managing virtual networks based on trust is one example of a needed networking capability that enhances the entrepreneur's success rate.

Not only the network broker or entrepreneur but all members of the virtual value network should contribute in the creation of value to the global marketplace and in achieving each other's objectives for participating in the virtual value network. Therefore, a systematic approach to the implementation of networking capabilities in virtual organizing is required since all members of the virtual value networks need to develop networking capabilities skills to succeed and excel in the virtual network of value chain members. The framework to be developed in the following chapters is emergent and exploratory, given the focus (networking capabilities) and context (virtual organizing). The framework is therefore intended to stimulate further discussion and exploration, both theoretical and empirical.

Chapter three considers aspects related to the research objective and the research approach. It includes a discussion of appreciative inquiry as an alternative to deficit thinking.

Chapter 3

The research objective and research approach

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3.1 Introduction

Chapter 1 presented the research problem as:

“To develop a framework of needed networking capabilities and their inter-relationships that enable successful virtual organizing in e-business”.

Chapter two further outlined, through a literature review, a complex network of inter-related aspects supporting the need for networking capabilities with virtual organizing. The research objective in this chapter directs the emphasis on the research methodology that will be introduced to gain insight on the identification and successful implementation of networking capabilities with web-based organizations consisting of virtual networks of value chain businesses. A statement of the research objective concludes the first section of the chapter. The last section of this chapter considers the overall research approach and the research methodology. The development of further, more specific elaborating and detailed questions on the research problem is addressed towards the end of the chapter.

The structure of the chapter can be summarized as follows. Section two of this chapter describes the research objective and gives an overview of the positive stance reflected in the problem statement as well as the research objective. The research questions are developed in Section 3, and Section four presents the research approach to be implemented, which includes an overview of research approaches, general considerations with regard to research approaches in the information systems field, considerations that relate to the qualitative research approach and the role of the researcher in the qualitative research approach. Section five describes the Grounded Theory method and the data that were used. Section six concludes the chapter.

3.2 The research objective

With the research problem identified in Chapter One and the literature overview completed the research objective will be defined. The purpose of defining the research objective is to specify the intended outcome of the research study. The starting point with the formulation of the research objective is the research problem, formulated in Chapter One as:

“To develop a framework of needed networking capabilities and their inter-relationships that enable successful virtual organizing in e-business”.

The literature overview in Chapter Two indicates that web-based organizations that implement virtual networks of independent firms need to understand, develop and excel at a complex network of interrelated networking capabilities that enable virtual organizing. It is important to consider that networking capabilities relate to all the members of the virtual value chain as well as the customers in e- business. How these networking capabilities relate to each other and to the actors in the virtual value chain active in e-business is not clear from the literature review. The research objective has therefore been formulated as follows:

“To develop better understanding of the capacity of networking capabilities to not only enable, but to enhance, effective and efficient virtual organizing in a virtual network of organizations”.

Since networking capabilities enable successful virtual organizing the objective is to develop a clear understanding of what constitutes networking capabilities and aspects pertaining to their interrelationships. The identified objective could lead to a greater understanding of the research problem in its bigger context and through this enhanced understanding contribute towards answering or resolving the research problem. In addition, the framework should provide some guidance to business and entrepreneurs on how to approach the implementation of

networking capabilities while considering the various interrelationships that exist between the networking capabilities that potentially enhance effective and efficient virtual organizing. The framework and underlying theory should indicate how the entrepreneur that implements a virtual network with virtual organizing leverages networking capabilities to realize the business objectives of the web-based business.

The study will be conducted using an appreciative approach to the research that should reflect in the objectives of the research project. The research approach has an impact on the way the results of the literature overview are approached as well as on the line of questioning used when conducting interviews. Appreciative inquiry is considered to be an affirmative form of inquiry with regard to the objectives of the research in contrast to the problem-oriented view that is inherent in most information systems research (Avital, 2003). Avital highlights the main differences in the approach to research between appreciative enquiry and deficit thinking that is illustrated in Table 3.1.

Table 3.1 Features of appreciative inquiry in contrast to deficit thinking
(Source: Avital, 2003)

	<i>Appreciative Inquiry</i>	<i>Deficit Thinking</i>
<i>Method Archetype</i>	Generative inquiry	Problem solving
<i>Drive</i>	Boundary spanning	Gap closing
<i>Focus</i>	What is best	What is wrong
<i>Tactical Objective</i>	Enable success	Prevent failure, fix problems
<i>Actors</i>	Whole systems	Varied, usually isolated entities
<i>Guiding Paradigm</i>	Voluntaristic	Mainly deterministic

When the appreciative approach to research is introduced to the research project it should be well reflected in the research objectives. The appreciative approach to research enables researchers to explicitly and intentionally put all possible

caveats aside and intentionally focus their attention on seeking and building upon what represents strengths, capacities, possibilities and goodwill (Avital, 2003).

The formulation of the research problem and the corresponding research objective along with the literature overview in Chapter Two allow the selection of a research approach and methodology.

The next section considers the research question as well as the development of supporting questions.

3.3 The research question

Strauss and Corbin (1998) define a research question as:

“The specific query to be addressed by this research that sets the parameters of the project and suggests the methods to be used for data gathering and analysis”.

This definition highlights the importance of developing research questions at the initial stages of research. They indicate that research questions dictate the choice of a method to be employed by the researcher. Research questions used with the grounded theory tend to be oriented towards action and process (Strauss and Corbin, 1990) that enable the development of theory or a framework.

The following two sub-sections describe the development of low level basic research questions using a process-based approach as discussed by Roode (1993). The final sub-section develops the fundamental research question.

3.3.1 Use of the process-based approach

Any study tries to answer one or more of the following basic questions with respect to the problem situation being investigated: What? Why? How does? How should?. Research questions typically inquire about the ontological, phenomenological, epistemological and normative nature of the problem or issue at hand (Roode, 1993: p. 71-72). Roode describes a framework for helping the researcher to pose different questions in order to explore different aspects of the problem or situation at hand. Figure 3.1 illustrates this framework.

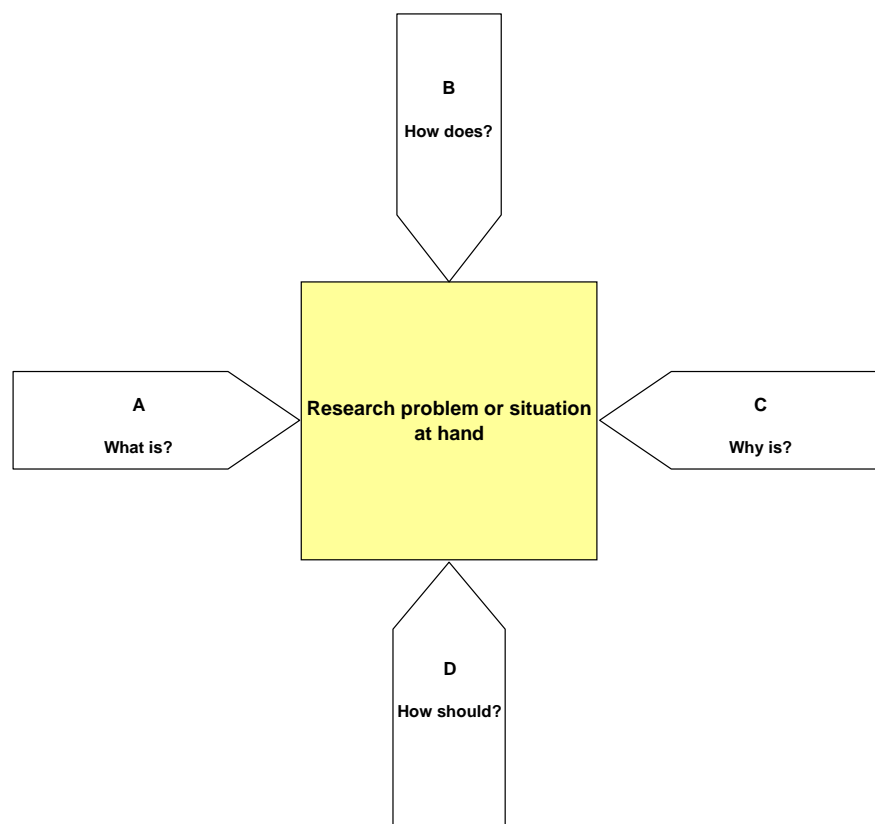


Figure 3.1 Framework for generating low level basic research questions (Source: Roode, 1993)

The framework, as illustrated in Figure 3.1, can be explained as follows (op.cit.):

- From the 'What is?' perspective: 'With this question the fundamental nature of essence of the research problem is first explored. The question intends exposing the structure of the problem or the meaning of the underlying concepts or ideas. The purpose is to inquire radically and critically about the problem domain and its accompanying paradigm(s) in order to be able to describe the problem precisely and unambiguously'. This approach to question formulation is underpinned by a fundamental assumption that such universally accepted descriptions for the concepts, ideas and problems do exist.
- From the 'how does?' perspective: 'In answering this question the phenomenon or problem is directly observed and described as it manifests itself in reality. In cases where abstract concepts or ideas are explored, these concepts would obviously not apply'.
- From the 'Why is?' perspective: 'The purpose of this question is to explain the real-life behaviour or characteristics of the phenomenon or problem. In doing so, the focus is on determining relationships between aspects of and/or variables within the problem domain. There is a fundamental assumption underlying this question namely that these relationships can be used to generalize about the problem domain and causal consequences'.
- From the 'How should?' perspective: 'This question focuses on the conclusions, implications and normative aspects of the research results. It is an evaluation of the results or new insights obtained during the research. In some cases it might lead to prescriptive conclusions regarding the problem domain- in other cases it might enhance the understanding of the problem domain or redefine it'.

Roode (private communication, 2006) further describes a framework to systematically develop research questions from the low level basic research questions generated by following the process-based approach. The bottom-up process is initiated with the formulation of low-level basic questions. These are then consolidated into clusters of related questions. The clusters of consolidated 'exploratory questions' are then refined and 'meta questions' are formulated to

describe the different clusters. Meta questions represent a higher and more abstract level from the initial exploratory questions developed. The eventual research questions are then formulated as meta-meta questions from the meta questions describing the clusters of consolidated low-level basic questions.

The application of the process-based approach and the subsequent bottom-up process are discussed below.

3.3.2 Categorization of research questions

The first step in the categorization of research questions is the development of exploratory questions using the process-based approach. They form the basis for the development of the meta and eventual research questions by the researcher. The development of these low-level basic questions builds on the literature overview presented in Chapter 2. The exploratory questions generated by using the process-based approach are listed in Table 3.2.

Table 3.2 Exploratory questions formulated using the process-based approach

'What is?' perspective	'How does?' perspective
<p>What is the enabling role of networking capabilities?</p> <p>What is the role of networking capabilities in the virtual network?</p> <p>What is the relation between virtual organizing and networking capabilities?</p> <p>What situations highlights the need for networking capabilities?</p> <p>What is the inter-relationship between the various networking capabilities?</p> <p>In what way can networking capabilities not only enable but enhance effective and efficient virtual organizing?</p>	<p>How does the framework of networking capabilities impact on the virtual network?</p> <p>How does the framework of networking capabilities impact on the role of the entrepreneur in the virtual network?</p> <p>How does the framework of networking capabilities enhance activities of virtual organizing?</p> <p>How does the virtual network implement networking capabilities?</p> <p>How do networking capabilities fit into the activities performed by the entrepreneur?</p> <p>What considerations guide the implementation of networking capabilities?</p>
'Why is?' perspective	'How should?' perspective
<p>Why does a virtual network needs to implement networking capabilities?</p> <p>Why do networking capabilities tend to enhance virtual organizing activities?</p> <p>Why does the entrepreneur need networking capabilities in the virtual network?</p> <p>Why do networking capabilities promote improved virtual organizing? Why do networking capabilities promote improved virtual organizing?</p>	<p>How should the entrepreneur implement the framework of networking capabilities?</p> <p>How should the entrepreneur develop networking capabilities of partners in the virtual network?</p> <p>How should the virtual network of partners approach the issue of networking capabilities?</p> <p>How should the implementation of networking capabilities to enhance effective and efficient virtual organizing be secured?</p>

The exploratory questions are specifically helpful in the process of data collection and data analysis as well as with the coding activities in the Grounded Theory method.

Based on the exploratory questions formulated as a first step in the development of the fundamental research question the meta questions can now be constructed and are outlined in Table 3.3.

Table 3.3 Constructing meta questions from the exploratory questions

<i>Exploratory questions</i>	<i>Meta questions</i>
What is the enabling role of networking capabilities?	What needs do entrepreneurs experience that highlight the need for networking capabilities that enables virtual organizing?
What is the role of networking capabilities in the virtual network?	What needs, actions and situations pertaining to virtual organizing trigger the need for networking capabilities?
What is the relation between virtual organizing and networking capabilities?	Under what circumstances are these needs for networking capabilities with virtual organizing highlighted?
Which situations highlight the need for networking capabilities?	For what purpose do entrepreneurs need to implement networking capabilities with virtual organizing?
What is the inter-relationship between the various networking capabilities?	
In what way can networking capabilities not only enable but also enhance effective and efficient virtual organizing?	
How does the framework of networking capabilities impact on the virtual network?	How are networking capabilities implemented in the virtual network of organizations?
How does the framework of networking capabilities impact on the role of the entrepreneur in the virtual network?	Which considerations guide the implementation of networking capabilities?
How does the framework of networking capabilities enhance activities of virtual organizing?	What is the rationale for each networking capability and its contribution to virtual organizing?
How do the virtual networks implement networking capabilities?	Where do networking capabilities fit into the virtual networks' coordination activities?
How do networking capabilities fit into the activities performed by the entrepreneur?	
What considerations guide the implementation of networking capabilities?	

Table 3.3 Constructing meta questions from the exploratory questions

<i>Exploratory questions</i>	<i>Meta questions</i>
Why do virtual networks need to implement networking capabilities?	What are the opportunities entrepreneurs envisage when they implement networking capabilities in virtual networks of organizations?
Why do networking capabilities tend to enhance virtual organizing activities?	How do these phenomena manifest in practice?
Why do entrepreneurs need networking capabilities in the virtual network?	What could be causing this phenomenon?
Why do networking capabilities promote improved virtual organizing?	
How should the entrepreneur implement the framework of networking capabilities?	How can the intended framework assist entrepreneurs in approaching the issues of networking capabilities as an organizational consequence of using?
How should the entrepreneur develop networking capabilities of partners in the virtual network?	How should the entrepreneur approach the virtual network in developing networking capabilities of its participating partners?
How should the virtual network of partners approach the issue of networking capabilities?	
How should the implementation of networking capabilities to enhance effective and efficient virtual organizing be secured?	

The above set of meta questions are now used to develop the main research questions.

3.3.3 The main research questions

The development of the four main research questions is outlined in Table 3.4 below and is based on an interpretation of the meta questions.

Table 3.4 Constructing the main research questions from the meta questions

<i>Meta questions</i>	<i>Basic research question</i>	<i>Rationale for question</i>
<p>Which needs do entrepreneurs experience that highlights the need for networking capabilities that enables virtual organizing?</p> <p>Which needs, actions and situations pertaining to virtual organizing trigger the need for networking capabilities?</p> <p>Under what circumstances are these needs for networking capabilities with virtual organizing highlighted?</p> <p>For what purpose do entrepreneurs need to implement networking capabilities with virtual organizing?</p>	<p>What are the needed networking capabilities that enable virtual organizing in a virtual network of companies?</p>	<p>The question has relevance because an understanding of the reasons why web-based organizations succeed at virtual organizing due to the implementation of networking capabilities.</p>
<p>How is networking capabilities implemented in the virtual network of organizations?</p> <p>What considerations guide the implementation of networking capabilities?</p> <p>What is the rationale for each networking capability and its contribution to virtual organizing?</p> <p>Where do networking capabilities fit into the virtual networks coordination activities?</p>	<p>How does the web-based organization approach the issue of obtaining and enabling networking capabilities in the virtual network?</p>	<p>The purpose of this question is to get a perspective of the inter-relationship between and the specific role of networking capabilities in the virtual network of organizations</p>

Table 3.4 Constructing the main research questions from the meta questions

<i>Meta questions</i>	<i>Basic research question</i>	<i>Rationale for question</i>
<p>What are the opportunities entrepreneurs envisage when they implement networking capabilities in virtual networks of organizations?</p> <p>How do these phenomenon manifest in practice?</p> <p>What could be causing this phenomenon?</p>	<p>Why is the concept of networking capabilities so important in virtual networks of organizations?</p>	<p>The question aims to establish the reasons why entrepreneurs find the concept of networking capabilities so important since it enables virtual organizing in the virtual network of organizations.</p>
<p>How can the intended framework assist entrepreneurs in approaching the issues of networking capabilities as an organizational consequence of using?</p> <p>How should the entrepreneur approach the virtual network in developing networking capabilities of its participating partners?</p>	<p>How should web-based organizations approach the issue of obtaining and managing networking capabilities in virtual networks of organizations?</p>	<p>This question explores the findings of the research</p>

The final sub-section describes the fundamental research question derived inductively from the four main research questions, in support of the research problem and research objective.

3.3.4 The fundamental research question

The main purpose for using the Grounded Theory method is to develop theory or a theoretical framework. To do this, a fundamental research question is required

that will give flexibility and freedom to explore a phenomenon in depth. The aim of this study was to answer the fundamental research question, namely:

“How can the development of a framework of network capabilities contribute to a better understanding of the critical role of network capabilities that not only enable but can enhance virtual organizing in a virtual network”.

The fundamental research question, inferred from the four main research questions, finally presents the focus and thrust of the research.

The next section considers aspects pertaining to the research approach that was followed by the researcher.

3.4 Research approach

The critically important question that needs to be answered in this section is which research approach is considered appropriate for investigating networking capabilities that enables virtual organizing. The first part of the discussion highlights the potential applications of both quantitative and qualitative research approaches. The second part of the discussion highlights some considerations pertaining to generally accepted research approaches in the information systems discipline. The third part of the discussion focuses on important aspects relevant to the chosen research approach. The final part considers the role of the researcher in the adopted research approach.

A The choice of an appropriate research approach

Klein and Myers (1999) indicate that quantitative methods have been used in interpretive research as qualitative methods have been used in positivist research. Rich and Ginsburg (1999) highlight the similarities that do exist where both methods of inquiry *‘share an investigative approach that poses a question, collects and analyzes data and presents results’* while *‘scientific rigor and the*

integrity of a theoretical framework is critical to both'. Hoepfl (1997) differentiates quantitative research that *'uses experimental methods and quantitative measures to test hypothetical generalizations'* from qualitative research that *'uses a naturalistic approach that seeks to understand phenomena in context – specific settings'*.

Quantitative research is mostly conducted in the positivist tradition (Bryman, 1999). De Vos (1998, p. 15) indicates that quantitative research methods deals with data that are essentially numerical; and the methods used with this research approach include laboratory experiments, mathematical modelling as well as econometrics. A quantitative research approach is therefore considered to be appropriate when there are strong theoretical underpinnings (Bryman, 1999). Quantitative researchers seek causal determination, prediction, and generalization of findings whereas the qualitative researcher seeks illumination, understanding and the extrapolation to similar situations (Hoepfl, 1997). Cronbach (1975) indicates that statistical research is not able to take full account of the many interaction effects that take place in social settings that importantly impacts on the decision of an adequate research approach to the stated research problem. This is in contrast to qualitative research that accepts the complex and dynamic quality of the social world.

It is also important to consider that the aim with this research project is to develop theory or at least a theoretical framework rather than to test theory. In contrast, Debreceny *et al.* (2002) explain the strength of the qualitative research approach as its capacity to explore human subject motivation and actions within a research study frame of reference, thereby exposing the richness of the data. In other words, qualitative research supports the researcher to progress in the development of theory while, as explained earlier, quantitative research in contrast enables the researcher to confirm or reject pre-existing theories. It can be argued that quantitative measures cannot adequately describe or interpret the existence or the applicability of networking capabilities that enable virtual organizing. The research problem clearly supports the discovery of new information that necessitates the implementation of the qualitative approach to

research. We therefore do not consider the quantitative research method to be appropriate to the specific needs of the research to be conducted.

B Generally accepted research approaches in the information systems field

Debreceeny *et al.* (2002) indicate that the principal research paradigm used in the information systems discipline is positivist. They also highlight that while the use of interpretive research is on the increase, its use is limited to relatively few studies. Avison and Myers (1995) indicate that there is a general shift in research to focus on managerial and organizational issues impacting on information systems. Walsham (1993: p. 4) confirms the applicability and the need to take into account organizational-related issues and their impact on the information systems field. Walsham (1995) also recognizes the importance of social issues considering their relation to computer-based information systems and the applicability of ‘*interpretive*’ investigations such as in-depth case studies. Debreceeny *et al.* (2002) importantly states that as an alternative to a positivist approach, the use of qualitative interpretive research is considered to be appropriate in the field of Electronic Commerce. It is important to note that qualitative research is not equivalent to interpretive research. Qualitative research can be positivist, interpretive or critical.

The next sub-section considers important aspects pertaining to the qualitative approach to research.

C Considerations related to the qualitative research approach

There are several considerations with respect to the qualitative approach to research methodology. Strauss and Corbin (1990, p.17) define qualitative research as “*any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification*”. They claim that qualitative methods are applicable to research that attempts to understand any phenomenon about which little is yet known. The qualitative research approach can also be used to gain new perspectives on things about which more is already known and to gain more in-depth information that may be difficult to convey

quantitatively. The ability of qualitative data to more fully describe the phenomenon as indicated in the research problem lends itself to the discovery of new information by means of interpretive and qualitative research.

The application and use of the qualitative research approach opens itself to new areas of research that are not always possible with quantitative research. Fouche and De Vos (1998: p. 72) consider the qualitative research approach to be applicable where specific situations exist that necessitates its implementation. These considerations are listed in Table 3.5.

Table 3.5 Motivations pertaining to the implementation of the qualitative research approach (Source: Fouche and De Vos, 1998: 72)

Important considerations that necessitates the implementing of the qualitative research approach
Research that cannot be done experimentally based on practical and / or ethical considerations
Research on variables that have not yet been identified.
Research on aspects of policy and practice pertaining to why and where it is not effective.
Research pertaining to unknown societies; also innovative systems.
Research that considers informal and unstructured linkages and processes pertaining to organizations.
Research that considers real, as opposed to specific and stated organizational goals.

Various terms such as “*experimental type research*” are used that refer to the characteristics of qualitative research. Since qualitative research methodologies in research projects have grown in acceptance in recent years its characteristics and features will be discussed next. Alexander (2002) refers to Busby and Payne (1998) in naming the following characteristics of qualitative research (Table 3.6.).

Table 3.6 Characteristics of qualitative research
(Source: Busby and Payne, 1998)

Characteristics of qualitative research	
<ul style="list-style-type: none"> • Holistic • Phenomena arise through a multiplicity of origins • Situated • Grounded, typically starting with data and developing theory by induction • Depends on good planning 	<ul style="list-style-type: none"> • Recognizes diversity • Based on fieldwork • Requires adaptability and high levels of cognitive effort, understanding and self-confidence on the part of the researcher • Complex and time consuming

Based on the input of several writers Hoepfl (1997) describes the features of the qualitative research approach as follows:

- Qualitative research uses the natural the natural setting as the source of data. The researcher attempts to observe, describe and interpret settings as they are, maintaining what Patton calls an “emphatic neutrality”.
- The researcher acts as the “human instrument” of data collection.
- Qualitative researchers predominantly use inductive data analysis.
- Qualitative research reports are descriptive, incorporating expressive language and the “presence of voice in the text”
- Qualitative research has an interpretive character, aimed at discovering the meaning events have for the individuals who experience them, and the interpretations of those meanings by the researcher. (Note: Hoepfl is not correct here: as noted before, “qualitative” is not a synonym for “interpretive”, and qualitative research can be positive, interpretive or critical.)
- Qualitative researchers pay attention to the idiosyncratic as well as the pervasive, seeking the uniqueness of each case.
- Qualitative research has an emergent (as opposed to predetermined) design, and researchers focus on this emerging process as well as the outcomes or

product of the research.

- Qualitative research is judged using special criteria for trustworthiness.

Although some researchers dispute this, the essential character of the Grounded Theory method is interpretive. Hughes and Jones (2003) provide the following guidance about the implementation of the Grounded Theory method to research projects:

- In the methodological context, the intended Grounded Theory method may differ from the method used because of the dynamics and context in the domain.
- Grounded Theory is consistent with interpretive case-based field studies dealing with social and organizational contexts.
- The researcher's personal constructs and skills help structure data and it is the researcher's hermeneutic perspective that maintains the interpretive style rather than the Grounded Theory method.
- Grounded Theory can be very time consuming, particularly in the transcribing, coding and comparing associated with the data analysis. To fully understand Grounded Theory, training in Grounded Theory followed by practical use of the methods in social science is suggested.
- Grounded Theory provides a useful template for researchers and can serve as a comfort factor for the stressful and uncertain nature of conducting qualitative research.
- Grounded Theory can generate local empirical theory which although not always generalizable will be generally useful.
- Grounded Theory can help provide confidence in original and rich research findings and theory because of its close tie to the data and the rigour of the method.
- Grounded Theory is rationalized as an external process, but in practice the method can be an internal process, that enables and facilitates creativity and innovation for the researcher.

The final sub-section considers the role of the researcher in the qualitative research approach.

D The role of the researcher in the qualitative research approach

In following a qualitative (interpretive) research strategy, the researcher views reality as subjective, and acknowledges the “intimate relationship between the researcher and what is studied” (Denzin and Lincoln, 1994: p. 2). The researcher interacts with the subject matter (including participants), and subjectively makes interpretations of data that are collected or received. This implies that the researcher’s personal experiences and background contribute unavoidably to the understanding of the phenomenon being studied, and this demands a sensitivity on the part of the researcher to be conscious of the possibility that bias could distort his/her interpretations.

Strauss and Corbin (1990: p. 42) refer to the importance of the “*theoretical sensitivity*” of the researcher in stating: “*Theoretical sensitivity refers to the personal quality of the researcher. It indicates an awareness of the subtleties of meaning of data, ...[It] refers to the attribute of having insight, the ability to give meaning to data, the capacity to understand, and capability to separate the pertinent from that which isn’t*”.

Strauss and Corbin (1990) indicate that the researcher obtain theoretical sensitivity from a number of sources, that include professional literature, professional experiences, and personal experiences.

It is important to acknowledge that bias is a reality that is present in all research conducted. Rich and Ginsburg (1999) stress that ‘*the influence of the researcher, the research question and the method employed can never be completely neutralized*’. Although it is possible for researchers that implement the qualitative approach to research to minimize the potential for bias that is inherent in their methods, they will not be able to completely eliminate a tendency to be biased. However, acknowledging that subjectivity can never completely be eliminated, it is the reflective, questioning process pertaining to qualitative investigation that influences the effect that bias may have on data collection, analysis, and drawing conclusions. These actions pertain to active observations, evaluation and counterbalances to be implemented in the process (Rich and Ginsburg, 1999).

A qualitative, interpretive research approach will be implemented in this research study. The qualitative research method that was selected was the Grounded Theory method.

The next section considers aspects of the Grounded Theory.

Table 3.7 Capabilities acquired in executing GTM

Capabilities needed	Description
Analytical skills	The ability to create order from very unordered sets of data.
Inductive reasoning	The ability to reason 'backwards'- e.g., to create categories given a set of concepts.
Persistence	The ability to read, read again and read yet again.

The researcher acquired these skills by stumblingly executing the steps of the GTM. All along, however, the researcher had to be open to learn from his experiences. Beginner researchers should therefore not expect to use the GTM with efficiency from the start. Rather, they should expect a slow but rewarding learning experience.

3.5 An overview of the Grounded Theory method

Since the Grounded Theory method is not widely used in the field of information systems details about the relevant principles and practices of the method are provided in this section. The Grounded Theory was first described by Glaser and Strauss in 1967 as a qualitative research method for the study of complex social behaviour from a sociological point of view. Grounded Theory has since been actively applied in various different disciplinary contexts (Strauss and Corbin, 1990). Grounded Theory is a primarily inductive investigative process in which the researcher attempts to formulate a theory or a theoretical framework about a

phenomenon. The method consists of systematically gathering and analyzing relevant data (Glaser, 1992). Due to the exploratory nature of this research and the intention to identify networking capabilities that enable virtual organizing, the Grounded Theory-based study of data interpretation was selected, and was blended with the case study design which will be discussed in Section 3.5.3.

It might be helpful at this stage to first consider the various understandings pertaining to the term ‘*theory*’ and what is meant with ‘*theory development*’ in the Grounded Theory method of research. Strauss and Corbin (1994, p. 274) mention the following aspects relating to the development and understanding of the term ‘*theory*’: “... *plausible relationships proposed among concepts and sets of concepts...Researchers are interested in patterns of action and interaction between and among various types of social units (i.e. actors)...They are also much concerned with discovering process – not necessarily in the sense of stages or phases, but in reciprocal changes in patterns of action / interaction and in relationship with changes of conditions either internal or external to the process itself*”.

According to Hughes and Jones (2003), Strauss and Corbin note two important features of the theory generated by the Grounded Theory method. “*Firstly that they are traceable to the data and secondly that they are ‘fluid’, that is to say the emphasis is on process and the temporal nature of the theory. So then ‘theory’ is used in the method to refer to local empirical models surrounding the phenomenon under study, it is not substantive. The theory is made apparent through the production of an ‘account’ and/or associated relationship diagrams of categories*” (Hughes and Jones, 2003).

In contrast, Strauss and Corbin claim the theory generated by the Grounded Theory method to be substantive, and this position will be maintained further in the study.

The effective application of the Grounded Theory method should produce a grounded theory, that is, a result grounded in and discovered from the data.

Strauss and Corbin (1990) conclude that the resulting theory should have fit and relevance, must work and be readily modifiable.

Researchers that implement the Grounded Theory approach start with a set of experiences they wish to explore. The basis of the Grounded Theory is that the researcher attempts to develop a theory inductively from various sources of data. The theory is generated (or grounded) in a process that consists of continual sampling and analysis of the data (Strauss and Corbin, 1990). Carvalho *et al.* (2002) refer to the dynamic relationship between the data collection and data analysis as an important characteristic pertaining to the Grounded Theory approach.

Carvalho *et al.* (2002) maintain that the Grounded Theory is shaped by two fundamental analytical commitments, namely, the method of constant comparison and theoretical sampling. They indicate that the method of constant comparison specifies that the researcher continually examines and compares elements such as data instances, emerging categories and theoretical propositions for the duration of the research project. Theoretical sampling relates to the sampling of new and relevant data as the process of analysis proceeds. This means that the researcher does not need to wait until all the data is collected for the process of analysis to commence. The data analysis starts the moment sufficient material is available to work on and drives the sampling of any additional data for the duration of the process. New data is selected for its potential to enhance the process of generating new theory by extending or deepening the researcher's evolving understanding of the phenomena being studied.

The methods most preferred for gathering data with the qualitative research approach include the use of observations, questionnaires and interviews. Strauss and Corbin (1990) indicate the investigation of archival materials as adequate in qualitative studies where data sources can be documents, newspapers or books. Strauss and Corbin (1990) maintain that a '*cache of archival material*' is equivalent to a collection of interviews and field notes. They indicate that when

archival material is used, the Grounded Theory procedures that include the sample and the interplay of coding and sampling follow the same techniques used with interviews and observational data. The documentary data should not be located from just a single place since any qualitative study that includes the Grounded Theory method values triangulation (i.e. the gather of the data from more than one source of evidence).

The process of analysis in the Grounded Theory begins with '*coding*' the relevant data. Seaman (1999) relates coding in the context of the Grounded Theory analysis as the process by which labels (or codes) are generated that describe the concepts and other relevant features pertaining to certain passages of data. The researcher continuously searches the data for any similarities as well as diversities and in the process collects a number of different indicators that may point to multiple qualitative aspects of a potentially significant concept. The researcher designates labels to the acquired passages of the text that are deemed to be relevant to an idea of interest in the study. The labelled passages of the text are searched for patterns and then grouped together. Each individual group (or category) is examined in search of meanings, themes and explanations of the phenomena.

The process of coding is very time consuming and requires the researcher initially to review sections of data repeatedly. Finally, the researcher assigns labels to pieces of the text, but the process is repeated once more in order to check for consistency in the codes used and to ensure that no relevant information has been overlooked. The pieces of the text that received a label vary in size and the same piece of text may be coded with different labels. Seaman (1999) indicates that the researcher may include a set of pre-formed codes at the start of the process which could have been developed from the goals of the study, the research questions at hand and pre-established variables of interest. Carvalho *et al.* (2002) indicate that codes may also be '*post-formed*' where the study objectives are very open and unfocused. They also indicate that the researcher can always add new codes or delete, modify, merge or sub-divide existing codes as the research progresses.

The resulting set of codes often has a structure that contains codes and sub-codes. It is quite possible for the researcher to identify some possibilities for sub-divisions that exist when re-reading the passages under specific headings.

The data analysis process in the Grounded Theory approach can be described and summarized as follows:

- The first stage of the analysis process consists of open coding that involves identifying categories and properties in the data. Open coding include the breaking down, examining, comparing, conceptualizing and categorizing of the data as explained above. The data is examined in order to fracture it and to generate codes. The open coding process will be dealt with in Chapters Four and Five.
- The axial coding process allows for the concepts that emerged during the open coding process to be reassembled with propositions about their relationships. In this stage the fractured data is reassembled by utilizing a coding paradigm that involves conditions, context, action or interactional strategies and consequences. The emerging propositions from a theoretical framework that serve as a guide to further data collection and analysis. The axial coding process will be dealt with in Chapters Four and Five.
- The selective coding process facilitates the identification of a core category with explanatory value that furthermore provides the main theme of the study. The identification of the core category initiates the process of selective coding that can also be described as the process of delimiting coding in order to arrive at only those concepts that relate to the core category. In other words, during the selective coding process the 'core category' (central phenomenon that needs to be theorized about) is identified. The different identified categories are then linked to the core category during the selective coding process. The selective coding process will be dealt with in Chapter Five.

The next important concept of the Grounded Theory method is the '*paradigm model*'. The paradigm model allows sub-categories to be linked to a category in a set of relationships representing causal conditions, phenomenon, context,

intervening conditions, action / interaction strategies and consequences. Strauss and Corbin (1990) indicate that the paradigm model enables the researcher to think systematically about the data at hand.

Causal conditions refer to the incidents or events that lead to the occurrence of the phenomenon. Context refers to specific properties of the phenomenon as well as to a series of particular conditions that affect the action or interaction strategies. Intervening conditions may have an influence by facilitating or constraining the action or interaction strategies in a particular context. Action or interaction strategies refer to the ways in which the phenomenon is managed, handled, carried out and responded to, in a certain context and under specific conditions.

Other strategies used by researchers in Grounded Theory include writing memos (Glaser, 1992). This is performed during the process of coding and the researcher gets to record his/her observations as the analysis proceeds. The goal of writing memos during the process of coding is to ensure that any '*preliminary hypothesis*' formulated by the researcher is not lost. It also supports the emergence of additional questions during the process and the re-examination of the data. The researcher may in addition seek new data to elucidate aspects of the emerging theory (this relates to theoretical sampling). Theoretical saturation occurs when new categories can no longer be found in the process of coding. When theoretical saturation is reached any additional attempts at data collection proves to be unproductive. At this stage the researcher defines all categories that have reached saturation, and begins to search for any relationships between the categories. The researcher then attempts to integrate the categories by establishing relationships between them. As a possible final result or potential outcome of the whole process the researcher attempts to formulate propositions that insightfully describes the phenomenon under study.

Strauss and Corbin (1990) suggest a list of seven criteria that can be used as guidelines when evaluating the research process in studies using the grounded theory. It is important to note that specific areas of investigation may require the

specific listed procedures to be adapted in order to fit the specific circumstances of the research (Carvalho *et al.*, 2002). The specific set of questions to be formulated when examining a Grounded Theory study is summarized in Table 3.8.

Table 3.8. Set of criteria to evaluate the empirical grounding of the study
(Source: Strauss and Corbin, 1990)

Criteria for evaluation purposes	
Criterion 1	Are the concepts generated?
Criterion 2	Are the concepts systematically related?
Criterion 3	Are there many conceptual linkages and are the categories well developed? Do they have conceptual density?
Criterion 4	Is much variation built into the theory?
Criterion 5	Are the broader conditions that affect the phenomenon under study built into its explanation?
Criterion 6	Has process been taken into account?
Criterion 7	Do the theoretical findings seem significant and to what extent?

The disadvantage that is linked to the use of constant comparison relates to the fact that the analysis process is not easy for the beginner researcher. It is furthermore considered to be a very subjective process and relies a great deal on the researcher's personal abilities. Seaman (1999) points out how the literature still lacks specific guidance that relates to the intellectual process of finding patterns in the data. Other benefits to be attained from implementing qualitative inductive methods such as the Grounded Theory relates to the situation where it leads the researcher to explore the complexity of the problem that have the potential to produce richer and more informative outcome or results.

The next sub-section considers the two main approaches to the Grounded Theory method.

3.5.1 The ‘*Glaserian*’ and ‘*Straussian*’ approaches to Grounded Theory

The natural evolution of the Grounded Theory in practice led to a disagreement between Glaser and Strauss about the way in which the Grounded Theory approach should be conducted. The Glaser (1992) approach allows for the central concept to emerge from the coding process and thereby reflects on the key problem as perceived by the actors being studied. In this approach to the Grounded Theory an area for study is selected. This approach then allows issues to emerge in the course of the research process.

The Strauss and Corbin approach to the Grounded Theory allows the researcher to elect in advance a focus of observation, interviews and archival gathering on a particular issue. Coding is then oriented around this specific issue. A central concept (or ‘*code*’) is then identified to represent the interplay of subjects as well as the researcher’s perceptions of the nature and dimensions of phenomena being studied. This approach to the Grounded Theory is therefore more specific. It promotes the identification of a phenomenon or issue to be studied. An important consideration with regard to the approach of Strauss and Corbin is that it follows a more structured set of analytical steps. This is very helpful when the researcher is inexperienced. It furthermore allows the inexperienced researcher to focus on a specific phenomenon or issue, guiding the efforts constructively to a conclusion.

The analytical method Strauss and Corbin subscribe to is regarded by Glaser to force rather than to allow for the emergence of theory from the data. This is in line with their approach to Grounded Theory that is more prescriptive in specifying the steps to be taken by a researcher in coding and analysing the identified phenomena. In his approach to the Grounded Theory, Glaser (1992) relies primarily upon the constant comparison of different incidents, perceptions, relationships and issues with the objective to identify any inconsistencies, contradictions, gaps in data and emerging consensus on key concepts and relationships. Glaser (1992) explicitly states that ‘*in Grounded Theory we do not*

know, until it emerges'. The use of an action paradigm model as proposed by Strauss and Corbin makes it possible to include empirical data at an early stage of the research. Glaser points out that using the paradigm model in the Grounded Theory forces pre-categorization on the data. Another advantage of the implementation of the action paradigm model is that identifying general action categories helps the researcher to systematize data and to see what is in it. It is of interest to note that Glaser and Strauss (1967) in earlier works also acknowledged this need for an individual perspective held by the researcher when entering the empirical field and analysing the data (Axelsson and Goldkuhl, 2004).

Researchers seem to experience practical problems in using the paradigm model in the coding process related to the discovery of potential relationships between codes and categories (Urquhart, 2001). The action paradigm model is viewed to be a strict linear model that inherently lends itself to complexities and practical problems in its use.

Some researchers seem to be very critical of aspects of the Grounded Theory approach to research. Bryant (2002), for instance, suggests that the Grounded Theory approach has an unclear ontological position. Such a viewpoint could be conceded as correct if all pre-conceptions are left out from the analysis (Axelsson and Goldkuhl, 2004) whereas Strauss and Corbin (1990, 1998) agree that pragmatic ontological assumptions should be allowed in the Grounded Theory method.

The next sub-section briefly reviews the use of the Grounded Theory approach in Information Systems research.

3.5.2 The use of Grounded Theory approach in Information Systems research

Hughes (2004) refers to Myers and Avison (1997) and Urquhart (2001) in stating that the use of Grounded Theory in the interpretivist tradition is growing in popularity in IS research literature. He highlights the ability of the method to support the development of context-based, process-oriented descriptions and explanations of the phenomenon under study. It is also important to note that the Grounded Theory is sometimes used in interpretivist studies in a contingent way. Researchers leverage the procedures and processes associated with the method when they focus on rigour and traceability in substantive theory development. Hughes (2004) refers to Baskerville and Pries-Heje (1999) in explaining how the Grounded Theory is considered to support rigour in the theory development part of action research.

Hughes (2004) questions whether there is some ‘*correct*’ way of applying the method whereas Strauss and Corbin (1994) are concerned about method diffusion. Hughes and Howcroft (2000) argue against the rigid application of the Grounded Theory in practice. Urquhart (2001) indicates that some of the seminal advice offered on the Grounded Theory is even contradictory, not least of all the disagreement between the two original co-authors on its use (Hughes, 2004). Urquhart (2001) summarizes the difficulties experienced with the use of the Grounded Theory as follows: “*Grounded theory is by definition a rigorous approach – it demands time, it demands a chain of analysis and the relating findings to other theories. As it is an inductive, emergent method that is located mainly in post-positivism, this means that researchers need to carefully consider their own philosophical position*”. The three recognized and most used philosophical perspectives to qualitative research in Information Systems include the positivist, interpretive and critical perspectives (Avison and Myers, 1995). Hughes (2004) concludes that in Information Systems research the Grounded Theory as a research method is predominantly used in interpretive studies.

Following the above review of the Grounded Theory approach, the focus shifts to this research study, and in particular, to the data that were used.

3.5.3 The data used

An approach that is often followed in conjunction with the Grounded Theory method, is to use a case study to investigate the particular phenomenon under study in order to collect the necessary data for analysis. Yin (1989) identifies the case study approach as follows: “A case study is an empirical inquiry that investigates a contemporary phenomenon within its real life context, when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used”. Taylor and McWilliam (2003) indicate that case studies are a worthwhile research approach from both an academic and industrial/commercial perspective because they allow explanations of particular phenomena derived from empirical research which may be valuable in other settings and organizations as interpretations of phenomena. Yin (1994) suggests that the case study ‘*benefits from the prior development of theoretical propositions to guide data collection and analysis*’ and this supports the Strauss and Corbin approach to the Grounded Theory that allows for the development of a preliminary framework.

Orlikowski and Baroudi (1991) refer to Darke *et al.* (1998) in explaining that case study research represents the most widely used qualitative research method in the field of Information Systems research. They emphasize that multiple case studies allow cross case analysis and comparison, and the investigation of a particular phenomenon in diverse settings. The case study research techniques used in qualitative research include a variety of sources, such as interviews, discussions, observation, document collection, and literature reviews (Yin, 1989). Walsham (1995) maintains that interviews represent the primary data source with respect to interpretive case studies.

In this research a variety of case studies were used in conjunction with the Grounded Theory method. First, in order to develop a preliminary framework, a literature case was used, described in A below. Second, in order to refine the preliminary framework, six field studies were conducted, described in B below. Finally, the concluding framework was validated against a specific case study, and this is discussed in Chapter 7, Section 7.6.

A Literature case used in the development of the preliminary framework

A literature case was used to develop the preliminary framework in Chapter Four. This means that technical literature, i.e., reports of research studies, publications and theoretical or philosophical journal papers characteristic of professional and disciplinary writing were used as the data source. The rationale behind this was simply that obtaining a similar rich set of data would have involved a wide range of data collection from a variety of sources both nationally and internationally. In terms of time and cost this was not within the scope of the research. It is submitted, however, that the data obtained from the literature provided an ideal starting point for the development of the preliminary framework, and that data otherwise collected, at source, would not easily have matched the richness of the data that were available through the literature consulted.

The 21 publications and papers included in the literature case are listed in Chapter Four. They were theoretically sampled from the bibliography used in the study – in other words, they were selected on the basis of the contribution they were deemed to make to the objective of this study – not on a random sampling basis.

B Field studies used to refine the preliminary framework

The preliminary framework was refined into a concluding framework. This is described in Chapter Five. In this context, refinement means improving on and expanding the preliminary framework along the dimensions of specificity, precision and density. A second objective is to achieve theoretical saturation of the framework.

In order to achieve this refinement, further data were collected in six separate field studies done at six South African web-based organizations. The organizations differ in terms of their e-product delivery, which are, respectively, marketing and strategic services; electronic products; and electronic products and information services. Interviews were conducted with the directors at each of the organizations. The interviews were transcribed and the resulting textual data used for analysis as was previously done with the textual data from the literature case.

3.6 Summary

The goal of this research project is to develop a framework of networking capabilities (and their inter-relationships) that enable virtual organizing in virtual networks of organizations. Chapter Three considered aspects pertaining to the research design to be implemented in the research study towards these objectives.

Chapter Three also considered the different research approaches and concluded that an interpretive, qualitative research approach would be appropriate. The specific qualitative research method that would be employed in the study is the Grounded Theory method.

An overview of the Grounded Theory method and related aspects were given in the following sections in Chapter Three. The main advantage of the Grounded Theory, as a qualitative research method, is that it uses a systemic set of procedures to develop an inductively derived theory, grounded in data, about the phenomenon.

The development of the framework consists of two steps. In Chapter Four, a preliminary framework will be developed through the literature case study and the concluding framework will be developed in Chapter Five using data obtained from six field studies.

The research process followed in this study is illustrated in Figure 3.2.

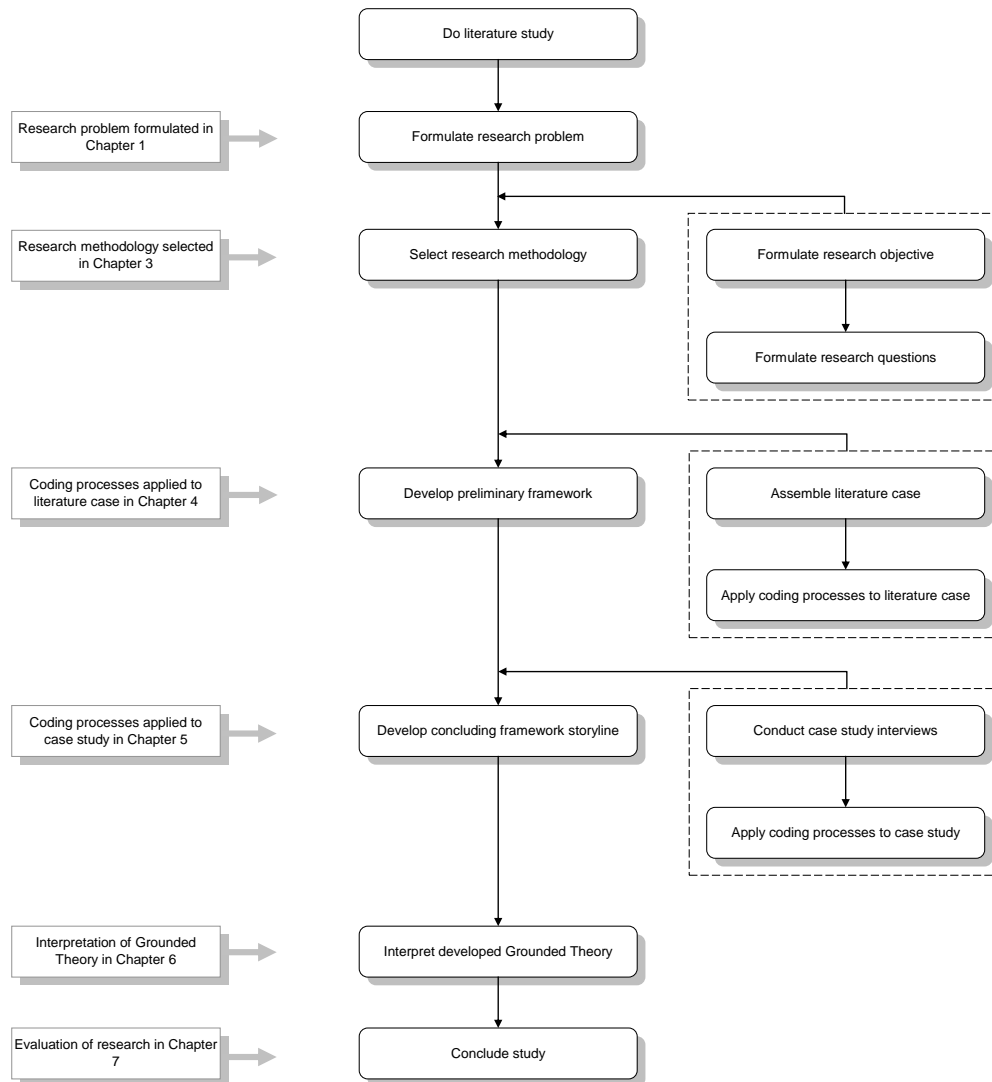


Figure 3.2. The overall research approach

The next chapter deals with the development of a preliminary framework based on the literature case.

Chapter 4

Developing the preliminary framework

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4.1 Background

The analytical procedures of Grounded Theory as defined by Strauss and Corbin (1990) were implemented in the study. This chapter explains how the Grounded Theory methodology was applied to generate a preliminary framework of networking capabilities used with virtual organizing in the global e-marketplace. A literature case was used in the research as the principle unit of data in the development of a preliminary framework. The grounded analysis of the literature case data enabled categories with properties and dimensions to be developed in the study. The implementation of the hierarchical coding process of the Grounded Theory methodology in the literature case is explained in this chapter. The resultant preliminary framework with its storyline or theoretical schema describes and indicates inter-relationships that exist between networking capabilities used in virtual organizing.

The literature review (Chapter 2) showed that the concept of networking capabilities is not clearly understood while relationships between networking capabilities, if any, have not yet been established. The development of the preliminary framework is intended to provide an integrated and systemic view of networking capabilities used with virtual organizing in the virtual value network of partners. The research project, with the implementation of the Grounded Theory methodology, aims to establish a concluding framework (Chapter Five) considered to be a theoretical framework that indicates reality rather than one's own perspective on the phenomena as well as to create more insight on the phenomenon (Morse and Richards, 2002) of the study.

The research procedure implemented in the development of the preliminary framework is outlined in Figure 4.1.

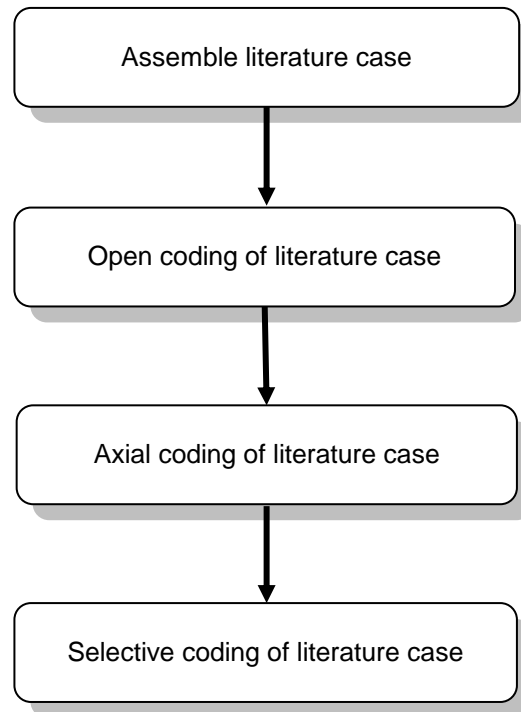


Figure 4.1 Development of the preliminary framework

There is no existing framework, to our knowledge, that provides insight or a central focus on networking capabilities used in virtual organizing. The difficulties experienced by entrepreneurs and their partners in virtual value networks can often be traced back to a lack of networking capabilities. The integration of processes in the virtual supply network of partners (Mirijamdotter and Somerville (2003, 2004) further highlights the need for a better understanding of networking capabilities used with virtual organizing. Sections 4.2 and 4.3 describe the literature case used in the development of the preliminary framework. Each step in the hierarchical process of coding is discussed under separate sub-sections. The importance of the resultant preliminary framework is discussed in section 4.5 and the chapter then concludes with a summary.

4.2 Preamble to the development of a preliminary framework

The data used in the development of the preliminary framework was a literature case, which will be discussed in more detail in the next section. Pandit (1996) and Le Roux (2001) also used a literature case for the development of a preliminary framework. Pandit refers to Strauss and Corbin (1990) to validate this approach to develop the preliminary framework:

The literature can be used as secondary sources of data. Research publications often include quoted materials from interviews and field notes and these quotations can be used as secondary sources of data for your own purposes. The publications may also include descriptive materials concerning events, actions, settings, and actors' perspectives, that can be used as data using the methods described. (p. 52)

Given the particular nature of the present research study, it was thought appropriate to use a literature case as a first data set. First, in Chapter Two, an extensive and penetrating overview was given of contemporary literature pertaining to the focus of the research study. This enabled the researcher to develop a good understanding of current ideas and research results about the object of the study. Second, it would have been quite difficult to equal or improve on this broad base of data by conducting interviews with entrepreneurs from select web-based organizations. Such organizations are typically geographically dispersed, and time and money implications would have been beyond the budget of the researcher.

Using a literature case to develop the preliminary framework does not mean that no empirical data was used in the study. As explained before, the development of the preliminary framework is followed by its refinement into a concluding framework (in Chapter Five), where the data used came from three empirical case studies.

4.3 Articles used in the literature case

Data sources including documents, newspapers or books also referred to as a 'cache of archival material' are considered to be equivalent to a collection of interviews and field notes (Strauss and Corbin, 1998). The initial case (unit of study) in the research consists of technical literature on the subject of the use of networking capabilities with virtual organizing in virtual value networks of partners. A grounded analysis of the first case, referred to as the literature case for purposes of further discussions, enables the development of the preliminary framework of networking capabilities.

The preliminary framework is expected to create more insights into the enabling role of networking capabilities in order to enhance effective and efficient virtual organizing in virtual networks of organizations. Chapter Five uses six empirical field studies in order to test, refine and extend the preliminary framework. Pandit (1996) refers to such empirical cases introduced only after the completion of the literature case. He indicates that these empirical cases have a dual purpose:

- To fill theoretical categories in order to extend the emerging framework
- To replicate previous cases in order to test the emerging framework.

The use of the empirical cases in this study was for the first of these purposes.

The publications and papers included in the literature case of the study are:

Benjamin, R. & Wigand, R. 1995. *Electronic markets and virtual value chains on the information superhighway*. Sloan Management Review, 36 (2), pp. 62.

Bhatt, G.D. and Emdad, A.F. 2001. *An analysis of the virtual value chain in electronic commerce*. Logistics Information Management, 14 (1), pp. 78 – 84.

Boudreau, M.C., Loch, K.D., Robey, D. and Straud, D. 1998. *Going Global: Using information technology to advance the competitiveness of the virtual transnational organization*. The Academy of Management Executive, 12 (4), pp. 120 – 128.

- Caldeira, M. and Ward, J. 2002. *Understanding the successful adoption and use of IS/IT in SME's: an explanation from Portuguese manufacturing industries*. Journal of Information Systems, 12, pp. 121 – 152.
- Christiaanse, E. and Kumar, K. 2000. *ICT-enabled coordination of dynamic supply webs*. International Journal of Physical Distribution & Logistics Management, 30 (3 / 4), pp. 268 – 285.
- Fitzpatrick, W.M. and Burke, D.R. 2001. *Virtual venturing and entry barriers: Redefining the strategic landscape*. SAM Advanced Management Journal, 6 (4), pp. 22 - 30.
- Franke, U. 1999. *Virtual web as a new entrepreneurial approach to network organizations*. Entrepreneurship and Regional Development, 11 (3), pp. 203 - 230.
- García-Dastugue, S. and Lambert, D. 2003. *Internet-enabled coordination in the supply chain*. Industrial Marketing Management, 32, pp. 251 – 263.
- Jarvenpaa, S., Tractinsky, N. and Vitale, M. 2000. *Consumer trust in an Internet store*. Information Technology and Management, 1 (1-2), pp. 45 – 71.
- Kasper-Fuehrer, E. and Ashkanasy, N. 2001. *Communicating trustworthiness and building trust in interorganizational virtual organizations*. Journal of Management, 27, pp. 235 – 254.
- Kotha, S. 1998. *Competing on the Internet: The Case of Amazon.com*. European Management Journal, 16 (2), pp. 212 – 222.
- Lorenzoni, G. and Baden-Fuller, C. 1995. *Creating a strategic center to manage a web of partners*. California Management Review, 37 (3), pp. 146.
- McAdam, R and McCormack, D. 2001. *Integrating business for global alignment and supply chain management*. Process Management Journal, 7 (2), pp. 113 – 130.

Papazoglou, M.P., Ribbers, P. and Salgatidou, A. 2000. *Integrated value chains and their applications from a business and technology standpoint*. Decision Support Systems, 29 (1), pp. 323 – 342.

Pihkala, T., Varamaki, E. and Vesalainen, J. 1999. *Virtual organization and the sme's: a review and model development*. Entrepreneurship & Regional Development, October-December 1999, 11 (4), pp. 335 – 349.

Serve, M. and Yen, D. 2002. *B2B - Enhanced supply chain process: toward building virtual enterprises*. Business Process Management Journal, 8(3), pp. 245 - 253.

Tetteh, E. and Burn, J. 2001. *Global strategies for SME-business: applying the small framework*. Logistics Information Management, 14 (1 / 2), pp. 171 - 180.

Van Hoek, R. 2001. *E-supply chains: virtually non-existing*. Supply Chain Management: An International Journal, 6 (1), pp. 21 - 28.

Voss, H. 1996. *Virtual organizations: The future is now*. Strategy & Leadership, 24 (4), pp. 12 – 17.

Watson, R., Akselson, S. and Pitt, L. 1998. *Attractors: Building mountains in the flat landscape of the World Wide Web*. California Management Review, 40 (2), pp. 36 – 56.

Weigand, H. and Van den Heuvel, W. 2002. *Cross-organizational workflow integration using contracts*. Decision Support Systems, 33 (3), pp. 247 – 265.

The decision to include an article in the literature case was based on its potential to deliver data on virtual organizing in the value network of partners. This may be illustrated by means of an example. Jarvenpaa and Tanriverdi (2002) in the article 'Leading virtual knowledge networks' mention various important concepts of virtual organizing. Their article published in Organizational Dynamics was not included in the literature case since it does not provide any detailed discussion. Data is the basic building blocks of GTM and articles were selected that provide detail discussion on virtual organizing.

One more important consideration guided the selection of articles for the literature case. Articles considered for inclusion needed to provide a holistic approach to the topic of virtual organizing in virtual value networks. An article that focused on only one aspect of virtual organizing was not considered for inclusion in the literature case.

The motivation and reason for the inclusion of articles in the literature case is listed in Table 4.1.

Table 4.1 Reasons for inclusion of publications and articles

Article	Motivation for inclusion of article
Benjamin, R. & Wigand, R. 1995. <i>Electronic markets and virtual value chains on the information superhighway</i> . Sloan Management Review, 36 (2), pp. 62.	Detailed and broad discussion of virtual organizing activities in the virtual value chain.
Bhatt, G.D. and Emdad, A.F. 2001. <i>An analysis of the virtual value chain in electronic commerce</i> . Logistics Information Management, 14 (1), pp. 78 – 84.	Number of different technical concepts of virtual organizing discussed.
Boudreau, M.C., Loch, K.D., Robey, D. and Straud, D. 1998. <i>Going Global: Using information technology to advance the competitiveness of the virtual transnational organization</i> . The Academy of Management Executive, 12 (4), pp. 120 – 128.	Technical discussion of concepts of virtual organizations in some detail.
Caldeira, M. and Ward, J. 2002. <i>Understanding the successful adoption and use of IS/IT in SME's: an explanation from Portuguese manufacturing industries</i> . Journal of Information Systems, 12, pp. 121 – 152.	Number of concepts of virtual organizing in supply network discussed.
Christiaanse, E. and Kumar, K. 2000. <i>ICT-enabled coordination of dynamic supply webs</i> . International Journal of Physical Distribution & Logistics Management, 30 (3 / 4), pp. 268 – 285.	Number of concepts of virtual cooperation in supply network discussed.
Fitzpatrick, W.M. and Burke, D.R. 2001. <i>Virtual venturing and entry barriers: Redefining the strategic landscape</i> . SAM Advanced Management Journal, 6 (4), pp. 22 - 30.	Strategic and overall look at virtual value networks.
Franke, U. 1999. <i>Virtual web as a new entrepreneurial approach to network organizations</i> . Entrepreneurship and Regional Development, 11 (3), pp. 203 - 230.	Extensive discussion of virtual organizing in the virtual value network.
García-Dastugue, S. and Lambert, D. 2003. <i>Internet-enabled coordination in the supply chain</i> . Industrial Marketing Management, 32, pp. 251 – 263.	Overall discussion of concepts of virtual coordination in virtual supply network.
Jarvenpaa, S., Tractinsky, N. and Vitale, M. 2000. <i>Consumer trust in an Internet store</i> . Information Technology and Management, 1 (1-2), pp. 45 – 71.	Discussion on virtual trust and impact on virtual organizing in the virtual value network.
Kasper-Fuehrer, E. and Ashkanasy, N. 2001. <i>Communicating trustworthiness and building trust in interorganizational virtual organizations</i> . Journal of Management, 27, pp. 235 – 254.	Provides thorough discussion on impact of trust formation on virtual organizing in virtual value network.
Kotha, S. 1998. <i>Competing on the Internet: The Case of Amazon.com</i> . European Management Journal, 16 (2), pp. 212 – 222.	Case study of Amazon with broad approach to virtual organizing in virtual value network.
Lorenzoni, G. and Baden-Fuller, C. 1995. <i>Creating a strategic center to manage a web of partners</i> . California Management Review, 37 (3), pp. 146.	Broad discussion of impact on virtual organizing in virtual supply network.

Table 4.1 Reasons for inclusion of publications and articles (continued)

McAdam, R and McCormack, D. 2001. <i>Integrating business for global alignment and supply chain management</i> . Process Management Journal, 7 (2), pp. 113 – 130.	Wide-ranging and technical discussion of virtual cooperation in virtual supply network.
McAdam, R and McCormack, D. 2001. <i>Integrating business for global alignment and supply chain management</i> . Process Management Journal, 7 (2), pp. 113 – 130.	Inclusive discussion on concepts of virtual organizing in virtual supply networks of partners.
Papazoglou, M.P., Ribbers, P. and Salgatidou, A. 2000. <i>Integrated value chains and their applications from a business and technology standpoint</i> . Decision Support Systems, 29 (1), pp. 323 – 342.	Widespread discussion on virtual coordination concepts in virtual value networks.
Pihkala, T., Varamaki, E. and Vesalainen, J. 1999. <i>Virtual organization and the sme's: a review and model development</i> . Entrepreneurship & Regional Development, October-December 1999, 11 (4), pp. 335 – 349.	Discussion of concepts of virtual organizing and networking capabilities.
Serve, M. and Yen, D. 2002. <i>B2B - Enhanced supply chain process: toward building virtual enterprises</i> . Business Process Management Journal, 8(3), pp. 245 - 253.	Broad look at various concepts of supply chain and virtual organizing.
Tetteh, E. and Burn, J. 2001. <i>Global strategies for SME-business: applying the small framework</i> . Logistics Information Management, 14 (1 / 2), pp. 171 - 180.	Different concepts of virtual organizing discussed in some detail.
Van Hoek, R. 2001. <i>E-supply chains: virtually non-existing</i> . Supply Chain Management: An International Journal, 6 (1), pp. 21 - 28.	Different wide-ranging aspects of virtual supply network discussed.
Voss, H. 1996. <i>Virtual organizations: The future is now</i> . Strategy & Leadership, 24 (4), pp. 12 – 17.	Discussion of virtual value network and implications for virtual organizing
Watson, R., Akselson, S. and Pitt, L. 1998. <i>Attractors: Building mountains in the flat landscape of the World Wide Web</i> . California Management Review, 40 (2), pp. 36 – 56.	Concepts of virtual value network with impact on virtual organizing discussed.
Weigand, H. and Van den Heuvel, W. 2002. <i>Cross-organizational workflow integration using contracts</i> . Decision Support Systems, 33 (3), pp. 247 – 265.	Practical case studies with discussion of impact on virtual organizing

These publications and papers formed the qualitative database used in the analysis process in order to arrive at a preliminary framework. The steps in the hierarchical coding processes of the Grounded Theory method are discussed in the next section.

4.4 Hierarchical processes of coding of the literature case data

The process of analysis in Grounded Theory is initiated with '*coding*' the data. Data analysis of the literature case can be explained as generating concepts through the process of coding that results in the development of categories. Strauss and Corbin (1998, p. 57) consider this to be the '*central process by which theories are built from data*'.

The hierarchical steps in the coding of data are open coding, axial coding and selective coding (see Chapter Three). These codes are generated and validated using the constant comparison method (Sarker *et al.*, 2001).

Open coding is concerned with labelling and categorizing of concepts in the data. Open coding involves the application of the 'constant comparison method' of asking questions and making comparisons. The data first needs to be broken down by asking simple questions such as what, where and how. Data are then compared and similar incidents are grouped together and given the same conceptual label. Axial coding is the process where data is put back together in new ways by making connections between a category and sub-categories. Axial coding involves the process of developing main categories as well as sub-categories. Selective coding involves integrating the categories developed in order to form the preliminary framework (Pandit, 1996).

The application of the three coding processes to arrive at the resultant preliminary framework is discussed in the next sub-sections.

4.4.1 Open coding of the literature case data

The purpose of analytic tools is to increase sensitivity, to help the user recognize 'bias' and to overcome 'analytic blocks' (Strauss & Corbin, 1998, p. 87). They indicate the '*use of questioning*', '*analysis of a word, phrase or sentence*' and '*further analysis through comparisons*' as analytical procedures for identifying

and developing categories. The main research question with the supporting research questions (Chapter Three) stimulate the generation of ideas as well as the ways the researcher looks at the data (Strauss & Corbin, 1998) in the process of discovering categories.

The main objective of qualitative research to develop theory requires the main research question to be framed in a '*manner that will provide the flexibility and freedom to explore the phenomenon in depth*' (Strauss and Corbin, 1998, p. 40). The implementation of research questions, both main and supportive, in grounded theory methodology tends to be action or process oriented and ensures that the researcher maintains focus (Strauss and Corbin, 1998).

One hundred and sixteen concepts were discovered to be grouped into categories. Strauss and Corbin (1998) define the term categories as "*Concepts that stand for phenomena*". The process of grouping the concepts at a higher, more abstract, level is defined as 'categorizing' in the Grounded Theory methodology.

Nine categories were discovered through the process of open coding. No sub-categories were identified. Initial identification of categories, derived from concepts, stimulated new concepts to be discovered from the data with resultant identification of new or changed categories. As part of the open coding process, categories are further specified in terms of their properties, as discussed later in this section. The process of open coding is illustrated in Figure 4.2

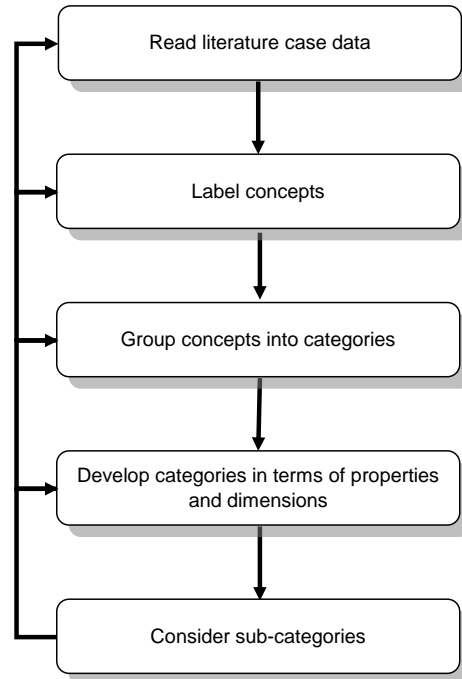


Figure 4.2 Open coding of literature case data

Analysis worksheets have been used in the research project to summarize and facilitate findings of the process of open coding indicated in Figure 4.2. Exhibit 4.1 is a sample illustrating how the analysis worksheets were used and how it worked in practice. Both the literature case study as well as the relevant nine coding analysis worksheets are included in Annexure 1.

Exhibit 4.1 Example of an analysis worksheet extracted from Annexure 1

Category		Web-based trust formation	
Concepts contained in the category			
<i>E-partner interest enhancement</i>		<i>Innovative e-product development</i>	
<i>Web-driven culture formation</i>		<i>E-partner profile development</i>	
<i>E-partner relationship building</i>		<i>E-partner commitment</i>	
<i>E-partner value chain collaboration</i>		<i>E-partner experience enhancement</i>	
<i>Shared virtual business strategy/vision</i>		<i>E-partner loyalty</i>	
<i>E-partners risk attitude</i>		<i>E-partner trust communication</i>	
Properties		Dimensions	
E-commerce value chain relationship		<i>Individual</i>	<i>Partnership</i>
E-partner business commitment		<i>Separate</i>	<i>Entity</i>
E-partner Information sharing		<i>Inaccurate</i>	<i>Accurate</i>
Web-based information exchange		<i>Irregular</i>	<i>Free-flow</i>
Web-based communication		<i>Forced</i>	<i>Spontaneous</i>
Sources			
Fitzpatrick, W. 2001 ; Franke, U. 1999 ; Jarvenpaa <i>et al.</i> , 2000 ; Kotha, S. 1998; Lorenzoni & Baden-Fuller, C. 1995 ; Pikhala <i>et al.</i> , 1999 ; Voss, H. 1996 ; Watson <i>et al.</i> , 1998 ; Kasper-Fuehrer, E. & Ashkanasy, N., 2001.			

Open coding of the literature case data resulted in the discovery of nine categories:

1. Web-based trust formation
2. Web-driven customer focus
3. Web-driven value chain integration
4. Web-driven partner communication
5. Web-driven partner learning
6. Supply chain shared e-commerce vision
7. E-commerce information management
8. Web-driven supply chain co-operation
9. E-commerce oriented product delivery

The developed categories were specified in terms of their properties and dimensions (Strauss and Corbin, 1998, p. 116). Properties indicate specific characteristics or attributes of a category whereas dimensions represent the location of a property along a continuum or range (Strauss and Corbin, 1998, p. 117). The worksheets for each of the nine identified categories indicating relevant properties and dimensions are listed in Annexure 1.

The nine categories developed using open coding will form the basic building blocks of the resulting preliminary framework. The nine categories identified through open coding and their relevant concepts are described in Table 4.2.

Table 4.2 The identified categories with relevant concepts

Web-based trust formation	Web-driven customer focus	Web-driven supply chain integration
E-partner interest enhancement	E-commerce customer loyalty development	Web-driven synchronized activities
Web-driven culture formation	Web-based customer partnership formation	Web-driven systems integrity
E-partner relationship building	E-customer value delivery	Service delivery capacity maximization
E-partner value chain collaboration	E-commerce product solution delivery	Web-driven value chain product delivery
Shared virtual business strategy / vision	Web-driven e-partner community development	Information driven inventory turnover enhancement
E-partners risk attitude	Web-based customer-to-customer interaction	Competence/resource utilization
Innovative e-product development	Web-based customer information support	Value chain integrated product delivery systems
E-partner profile development	Web-driven customized needs delivery	Real-time value chain process information exchange
E-partner commitment	E-partner personalized customer interaction	Value chain information broker capabilities
E-partner experience enhancement	Customer value change responsiveness	Value-chain partners minimization
E-partner loyalty	E-product service orientation	Real-time performance measurement
E-partner trust communication		Real-time process system integration
		Supply chain flexibility
Web-driven partner communication	Web-driven partner learning	Supply chain shared e-commerce vision
Web-driven consumer interest intelligence	E-partner quality expertise enhancement	E-partner strategic fit
Web-driven partner relationship building	Web-driven efficiencies enhancement	E-market scale efficiencies
Web-based effective product information exchange	E-partner value chain network formation	E-customer innovative value delivery
Web-based brand enhancement	Web-driven value chain process re-engineering	E-customer loyalty creation
Web-based authoritative product selection support	E-commerce customer value proposition	E-customer focused shared understanding
E-partner specialized information transfer	E-partner learning culture development	E-commerce value delivery change agents
Web-based customer support	Flexible value chain capabilities	Web-driven concept market delivery
Web-driven customer need / relations	E-commerce product innovation	E-partner complementary specialization
Value chain logistics effectiveness	E-commerce customer value shifts identification	E-value delivery differentiation
E-partner strategic information exchange	E-partner skills development	E-commerce innovation leadership
Value-chain information exchange	E-partner market orientation	E-partner innovative product leadership
	E-partner value chain efficiency	E-product value shift response
	E-partner value adding capability	E-market development/penetration
		E-market share enhancement

Table 4.2 The identified categories with relevant concepts (continued)

E-commerce information management	Web-driven supply chain co-operation	E-commerce oriented product delivery
E-partner information/intelligence system	E-partner protocol to cooperation	E-market 'one-stop' shopping
System information enhancement	E-partner information leverage	E-solution product delivery
Web-driven business objectives alignment	E-partner specialization interdependence	E-product feature enhancement
E-commerce global customer segmentation	Web-based real-time customer interaction	E-partner product design focus
E-partner product information leverage	E-partner relationship structuring	E-value delivery focus
Web-based rich/unique information	Supply chain capability efficiency	Global customer segment business management
E-commerce oriented value proposition determinants	E-partner relationship coordination	Customized product delivery
E-partner quality information search capabilities	E-partner unique product enhancement	E-partner flexible response
E-commerce brand differentiation	Inter-organizational system development	New technology enabled product offerings
E-commerce product intelligence	E-partner customer solutions	Product related innovation capabilities
E-commerce product offering value proposition	Product offering quality specification	Web-technologies implementation
New product to e-commerce market timing	E-partner enabled economies of scale	Product delivery capabilities development
E-customer value shift needs		E-product service delivery time
E-customer buying pattern intelligence		E-market development
E-partner real-time information sharing		
E-partner organizational memory enhancement		

Axial coding procedurally follows after the open coding process has been completed (See Figure 4.1). Axial coding in the Grounded Theory methodology enables identified categories to be linked at the level of properties and dimensions. The next sub-section explains how inter-relationships between the nine identified categories were established through the implementation of the paradigm model of Grounded Theory.

4.4.2 Axial coding of the literature case data

Axial coding is the next step after the completion of the open coding process of the Grounded Theory methodology. Using open coding a set of nine categories was discovered. Using axial coding the nine identified categories were ordered and arranged in terms of their relationships with each other. The process of axial coding is illustrated in Figure 4.3.

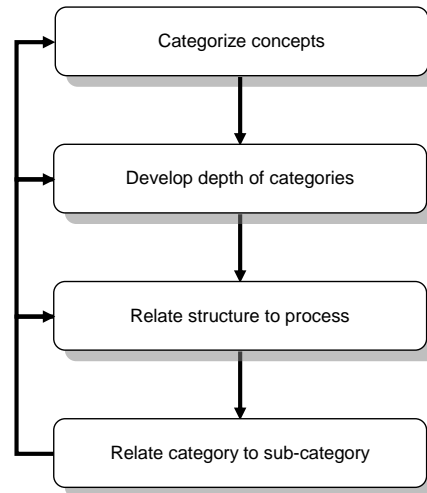


Figure 4.3 Data analysis during axial coding

Axial coding can be described as a set of procedures that allows data to be put back together in new ways after the process of open coding has been completed. This is accomplished by making connections between categories.

The networking capabilities included in the framework are defined in Table 4.3.

Table 4.3 Definitions of networking capabilities

Web-based trust formation	Ability to identify, define and develop strategies to address existing doubts and fears of potential users in the e-marketplace in order to turn potentials into partners.
E-commerce information management	Capability pertaining to information acquisition and information utilization that relates to customers and competitors to enhance marketing strategy decisions.
E-commerce oriented product delivery	Capability that enables the e-business to develop, add value and differentiate its offerings as well as commercialize this product offerings in the virtual value network of partners.
Web-driven supply chain co-operation	Collective capability that enables dependencies pertaining to skills, expertise and competencies to be leveraged in the virtual supply chain of partners.
Web-driven value chain integration	Collective capability to identify, develop and implement business processes for producing and delivering products and services in electronic markets.
Supply chain shared e-commerce vision	Collective capability to identify, define and develop customer value to be delivered in electronic markets.
Web-driven customer focus	Capability of the firm to identify, define and develop strategies to address market-related needs of users in electronic markets.
Web-driven partner communication	Capability to establish linkages of interactivity that enable and promote the sharing of information in the virtual value network of partners.
Web-driven partner learning	The capability to acquire, disseminate and use information obtained through inter-relationships with partners in electronic markets that impact customer value delivery.

An underlying assumption of the Grounded Theory methodology is that each category has links with other categories established during the open coding process: the final element of axial coding, according to Strauss and Corbin (1998, p. 126) entails the process of '*looking for cues in the data that denote how major categories might relate to each other*'.

The next step in the process of axial coding therefore is to search for and establish relationships between the categories identified in open coding of the

literature case data. The links that were identified from the literature case data are indicated in Table 4.4.

Table 4.4. The inter-relationships between categories

To / From	Web-driven value chain integration	Web-driven customer focus	Supply chain shared e-commerce vision	Web-based partner trust formation	E-commerce information management	Web-driven supply chain cooperation	Web-driven partner communication	Web-driven partner learning	E-commerce oriented product delivery
Web-driven value chain integration				Enables and supports					
Web-driven customer focus					Serves and supports				
Supply chain shared e-commerce vision				Enables					
Web-based partner trust formation					Enables				
E-commerce information management									Enables
Web-driven supply chain cooperation					Supports and delivers				
Web-driven partner communication					Determine and specify				
Web-driven partner learning					Serves and supports				
E-commerce oriented product delivery				Support and results in					

The links between categories, listed in Table 4.4, may also indicate subordinate-relationships between identified categories. A subordinate category is referred to as a sub-category in the Grounded Theory method. A sub-category implicates the existence of similar meaning to be established with a different category identified in the process of open coding. Axial coding of the literature case data

indicates that no sub-categories could be established from the literature case data.

The research study deviated from the procedure for the use of the Grounded Theory methodology (Strauss and Corbin, 1990) in reporting the findings of the analysis of literature case data. The introduction of the paradigm model of axial coding is only discussed in the next section since its use [in axial coding] enabled relationships between categories to be discovered that happened concurrently with the identification of the core category of selective coding. All relevant concepts that relate to the paradigm model and core category are explained and dealt with in sub-section 4.5.3.

The next section discusses the use of selective coding in order to develop the preliminary framework with storyline of the study.

4.4.3 Selective coding of the literature case data

Selective coding in the Grounded Theory methodology involves integrating the nine categories developed in open coding to form the preliminary framework. The preliminary framework integrates the categories around the core category in the study (which will be discussed later on in the sub-section). Integrating the nine categories is made possible with the paradigm model that functions as a process model linking the action/interactional sequences. Selective coding of the literature case data enables the preliminary framework with storyline to be developed that indicates and explains inter-relationships between the categories of open coding.

The process of selective coding is illustrated in Figure 4.4.

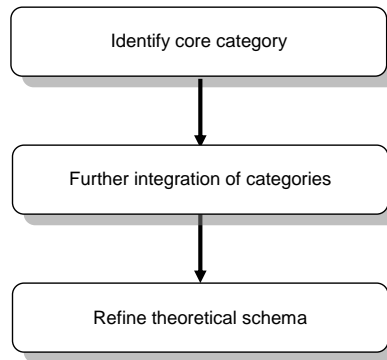


Figure 4.4 The process of selective coding

In the selective coding process the paradigm model (discussed below) was used to consider the conditions for the use of networking capabilities in virtual organizing, the context in which networking capabilities need to be used with virtual organizing in virtual value networks of partners; the action/interaction strategies that indicate the inter-relationships between networking capabilities implemented and the consequences of the strategies that relate to desired outcomes of the implementation of various identified networking capabilities (Strauss & Corbin, 1998, p.130).

Strauss and Corbin (1998, p.142) explain the paradigm model to be '*just one device that analysts can use to think about relationships*' between categories developed in the open coding process. The paradigm model is considered to provide a useful perspective on the literature case data to uncover and explain relationships that exist between categories and sub-categories (Strauss and Corbin, 1998, p. 128). Strauss and Corbin (1998, p.128) consider the paradigm model to be '*another analytical stance that helps to systematically gather and order data in such a way that structure and process are integrated*' which are closely related to the process of selective coding that Pandit (1996) describes as '*the integration of the categories that have been developed to form the initial theoretical framework*' of the study.

Central to the paradigm model is the core category which needs to be explained in relation to causal conditions, context, intervening conditions, action/interaction strategies and consequences. The basic features of the paradigm model are illustrated in Figure 4.5.

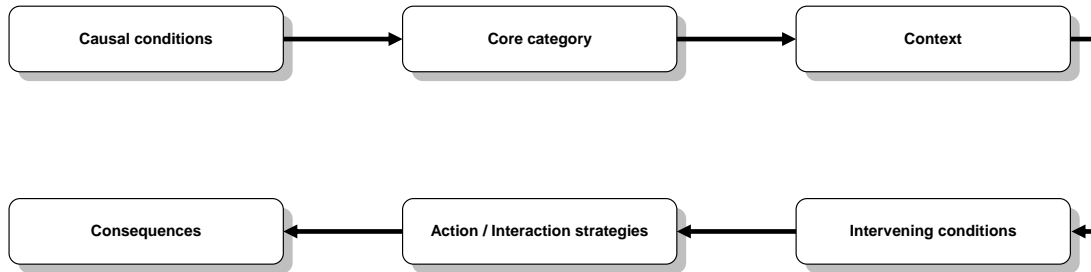


Figure 4.5 Basic features of the paradigm model

The components that form part of the paradigm model are illustrated in Figure 4.6 and listed in Table 4.5.

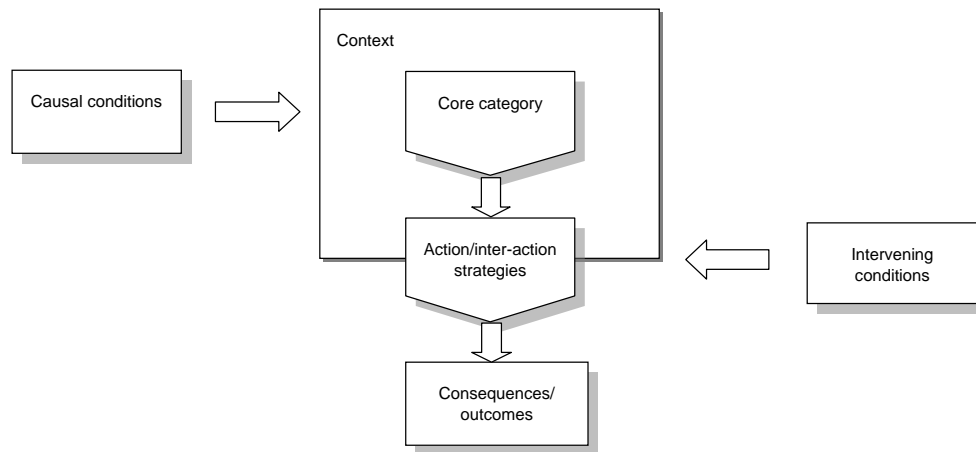


Figure 4.6 Simplified paradigm model (Adapted from Le Roux, 2001)

Table 4.5 The components of a paradigm model

Component	Description
Core Category	<i>The term indicates an extraordinary or remarkable thing. A core category indicates a problem, issue, an event, or a happening that is defined as being significant to respondents (Strauss and Corbin, 1996).</i>
Causal Condition	<i>The events that lead to the development of the core category (Pandit, 1996)</i>
Context	<i>Refers to the particular set of conditions and intervening conditions, the broader set of conditions, in which the phenomenon is couched (Pandit, 1996).</i>
Intervening Conditions	<i>These conditions act to either facilitate or constrain the action/interaction strategies taken within a specific context. Intervening conditions can be thought of as the broad structural context pertaining to the phenomenon. May have influence by facilitating or constraining the action/ interaction strategies, in a particular context (Strauss and Corbin, 1996, p. 132-133).</i>
Action/ interaction strategies	<i>The actions and responses that occur as the result of the phenomenon (Pandit, 1996). Action / interaction strategies are strategic or routine responses made by individuals or groups to issues, problems, happenings or events that arise under those conditions and are represented by the questions by whom and how (Strauss and Corbin, 1996, p. 128).</i>
Consequences	<i>Refers to outcomes, both intended and unintended, of actions and responses (Pandit, 1996). Are represented by questions as to what happens as a result of those actions/interactions or the failure of persons or groups to respond to situations by actions/interactions, which constitutes an important finding in and of itself (Strauss and Corbin, 1996, p. 128).</i>

During the process of identification and verification of relations between the emerging categories of open coding ‘*Web-based trust formation*’ was identified as the core category of the paradigm model. ‘*Web-based trust formation*’ was found to be the category which best enables and facilitates the creation of orderly systematic relationships (Strauss and Corbin, 1990, p. 124) to be established according to the paradigm model.

The components of the paradigm model stimulated the process to link categories identified in the data, classifying them as causal conditions, context, intervening conditions, action-interaction strategies or consequences. The paradigm model thus enabled the nine networking capabilities, identified in the open coding process, to be systematically aligned in a structure around the core category.

The next step in the process of selective coding allowed for the other categories to be related to the core category. The process demands that each category be evaluated individually in relation to the core category, namely, '*Web-based trust formation*'. For purposes of discussion, to illustrate the process, we consider '*Web-driven supply chain co-operation*'. Questions were used to determine where each category fits in the paradigm model. This is illustrated in Figure 4.7.

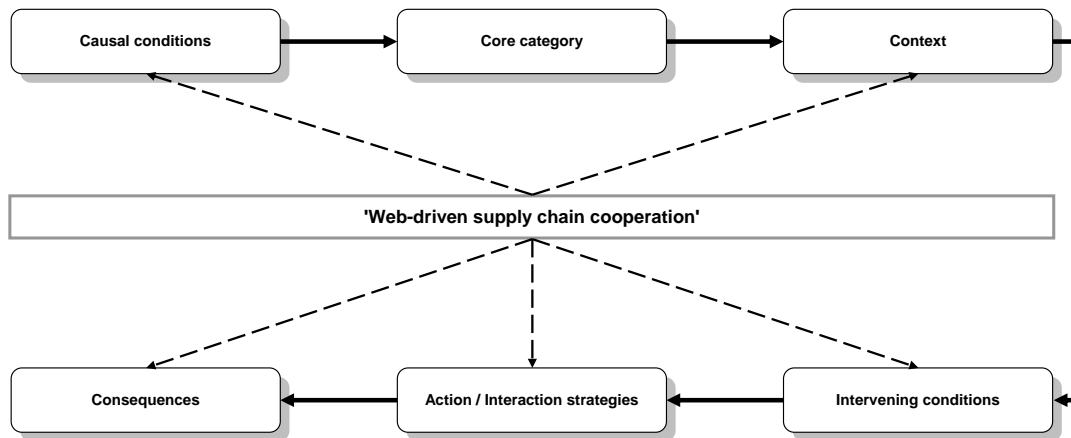


Figure 4.7 Linking a category to components of the paradigm model

The category named '*Web-driven supply chain co-operation*' may be linked to any of the components of the paradigm model. The question that had to be answered, was where the specific category fits best in the paradigm model. That is: "Is it an intervening or a causal condition? Is the category action oriented or does it apply to the context? Asking additional questions were helpful to establish whether a category was caused by another of the identified networking capabilities. This line of questioning enabled the researcher to conclude that '*Web-driven supply chain co-operation*' should be considered a causal condition in relation to the core category of the paradigm model. Similarly, an additional two categories were identified as causal conditions to the core category, namely '*Web-driven value chain integration*' and '*Supply chain shared e-commerce vision*'.

With the core category identified as '*Web-based trust formation*', a new line of questioning had to be implemented to determine which categories could be linked to action/interaction strategy used in virtual organizing. The process led to the category '*E-commerce information management*' to be selected as the action/interaction strategy of the paradigm model.

The next step in the process was to determine which of the categories might intervene or mediate the action / inter-action strategy identified as '*E-commerce information management*'. The processes '*Web-driven customer focus*', '*Web-driven partner learning*' and '*Web-driven partner communication*' were identified as the intervening conditions in the paradigm model.

The process then concluded with the introduction of a line of questioning aimed at determining which categories identified in the open coding process related to consequences. The conclusion was drawn that the networking capability '*E-commerce oriented product delivery*' best fits the component of consequences.

The development of the paradigm model was an iterative process where the relationship of each category and its fit in the paradigm model were verified through recurring systematic analysis. Construct validity as well as relationships validity of the paradigm model was established in the process of generating and testing propositions.

The identified relationships between categories of the paradigm model are presented in Table 4.6.

Table 4.6 The identified relationships between various categories

	Categories
Causal conditions	<p><i>Web-driven value chain integration</i></p> <p><i>Supply chain shared e-commerce vision</i></p> <p><i>Web-driven supply chain co-operation</i></p>
Context	<p><i>Virtual organizing in e-business suggests high levels of trust between partners and customers.</i></p>
Core category	<p><i>Web-based partner trust formation</i></p>
Action/ interaction strategies	<p><i>E-commerce information management</i></p>
Intervening conditions	<p><i>Web-driven customer focus</i></p> <p><i>Web-driven partner communication</i></p> <p><i>Web-driven partner learning</i></p>
Consequence /outcome	<p><i>E-commerce oriented product delivery</i></p>

The grounded analysis of the technical literature on the subject area thus led to the paradigm model, illustrated in Figure 4.8.

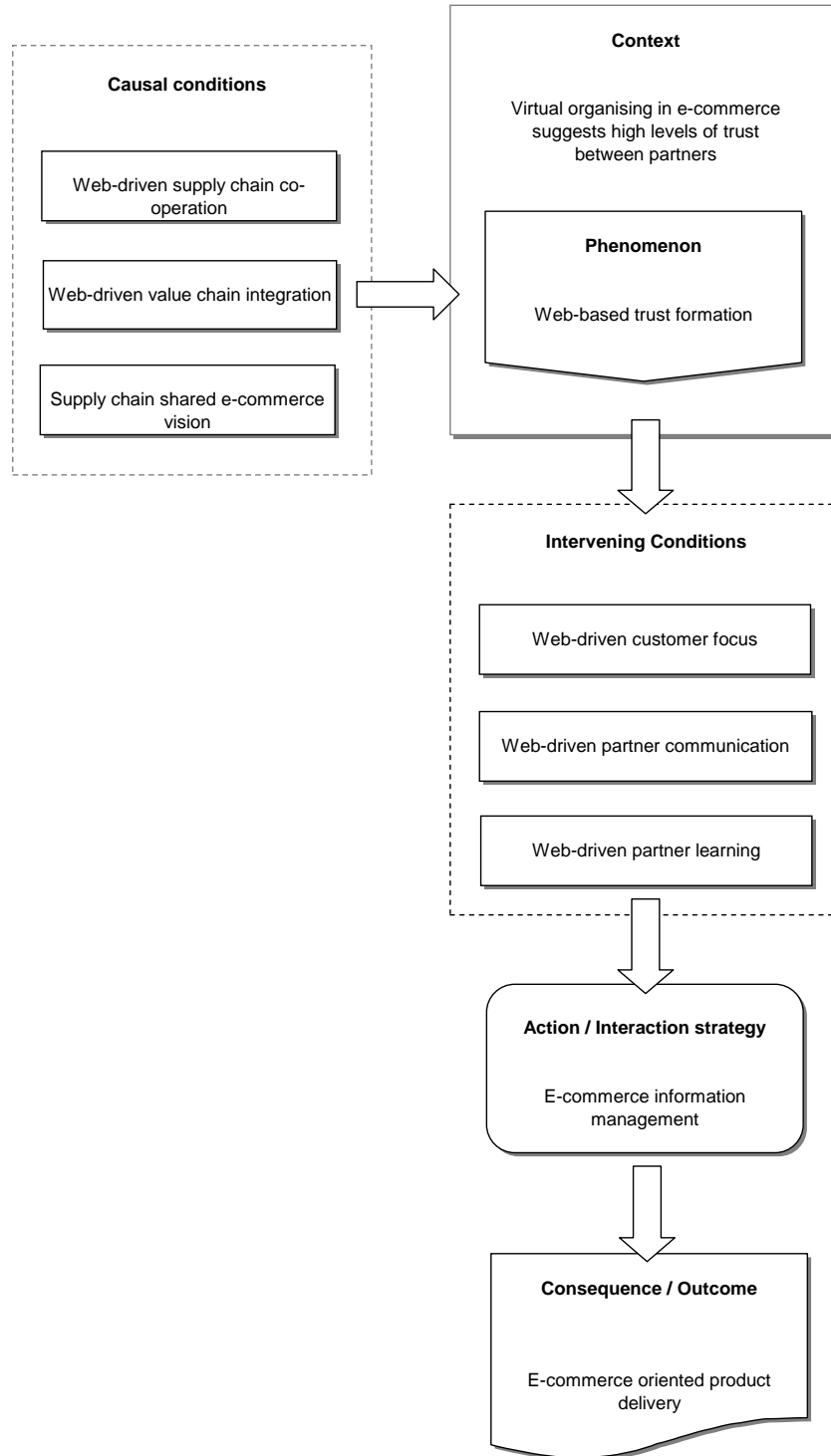


Figure 4.8 The resulting paradigm model of the central phenomenon

The third element of Grounded Theory is propositions that describe relationships between the components of the paradigm model. Propositions '*indicate generalised relationships between a category and its concepts and between discrete categories*' (Pandit, 1996). Pandit (1996) refers to Whetten (1989) and differentiates between propositions that '*involve conceptual relationships*' and hypotheses that '*require measured relationships*'. Strauss and Corbin (1998, p.135) describe 'hypotheses' as '*hunches about how concepts relate*'. Hypotheses about related concepts, i.e., about concepts that are linked, explain the what, why, where and how of a particular phenomenon (Strauss and Corbin, 1998, p. 135.). The development of propositions is an iterative process aimed at validating relationships among categories that were integrated in the paradigm model.

The nine propositions that have been generated, refined and validated through continuous comparison of the literature case data are listed in Table 4.7. These propositions may also be referred to as the 'generalized relationships' of the paradigm model (Pandit, 1996) in the development of the preliminary framework with storyline.

Table 4.7 Propositions generated from the literature case data

Propositions	Explicitly supported by:	Implicitly supported by:
<i>Successful e-commerce oriented product delivery supports more effective web-based trust formation</i>	Jarvenpaa <i>et al.</i> , 2000;	Tetteh & Burn, 2001; Jarvenpaa <i>et al.</i> , 2000; Franke, 1999;
<i>Web-driven supply chain cooperation used in virtual organizing supports effective web-based trust formation</i>	Voss, 1996; Lorenzoni & Baden-Fuller, 1995; Franke, 1999;	Voss, 1996; Weigand & vd Heuwel, 2002; Kasper-Fuehrer & Ashkanasy, 2001;
<i>Successful web-driven value chain integration with virtual organizing supports effective web-based trust formation</i>	Kasper-Fuehrer & Ashkanasy, 2001; Lorenzoni & Baden-Fuller, 1995; Franke, 1999;	Weigand & vd Heuwel, 2002;
<i>Supply chain shared e-commerce vision supports web-based trust formation in virtual organizing</i>	Voss, 1996; Watson <i>et al.</i> , 1998; Kasper-Fuehrer & Ashkanasy, 2001; Lorenzoni & Baden-Fuller, 1995;	Kasper-Fuehrer & Ashkanasy, 2001; Franke, 1999; Pihkala <i>et al.</i> , 1999;
<i>Web-based trust formation enhances effective e-commerce information management in virtual organizing</i>	Kasper-Fuehrer & Ashkanasy, 2001; Jarvenpaa <i>et al.</i> , 2000;	Lorenzoni & Baden-Fuller, 1995;
<i>The achievement of web-driven customer focus supports effective e-commerce information management</i>	Serve <i>et al.</i> , 2002; Van Hoek, 2001; Watson <i>et al.</i> , 1998; Kotha, 1998; McAdam & McCormack, 2001;	Tetteh & Burn, 2001; Garcia-Dastugue & Lambert, 2003; Benjamin & Wigand, 1995; Boudreau <i>et al.</i> , 1998;

Table 4.7 Propositions generated from the literature case data (continued)

Propositions	Explicitly supported by:	Implicitly supported by:
<i>Successful web-driven partner communication supports effective e-commerce information management in virtual organizing</i>	Voss, 1996; Watson <i>et al.</i> , 1998; Garcia-Dastugue & Lambert, 2003; Lorenzoni & Baden-Fuller, 1995;	Serve <i>et al.</i> , 2002; Tetteh & Burn, 2001; Kotha, 1998; McAdam & McCormack, 2001;
<i>Successful web-driven partner learning supports effective e-commerce information management in virtual organizing</i>	Serve <i>et al.</i> , 2002; Van Hoek, 2001; Caldeira & Ward, 2002; Bhatt & Emdad, 2001;	Tetteh & Burn, 2001; McAdam & McCormack, 2001; Fitzpatrick & Burke, 2001
<i>Effective e-commerce information management supports e-commerce oriented product delivery</i>	Serve <i>et al.</i> , 2002; Tetteh & Burn, 2001; Watson <i>et al.</i> , 1998; Benjamin & Wigand, 1995; Bhatt & Emdad, 2001;	Van Hoek, 2001; McAdam & McCormack, 2001;

These propositions were generated using the literature case data and link concepts and categories including the core category of the paradigm model. The propositions indicate how the categories developed in open coding are related to the key phenomenon ‘*Web-based trust formation*’.

One of the propositions that was developed from the literature case data indicates that successful e-commerce oriented product delivery supports more effective ‘*Web-based trust formation*’. This shows that ‘*E-commerce oriented product delivery*’, which was previously (see Table 4.6) established as an outcome or consequence, also features as a causal condition for ‘*Web-based trust formation*’.

The set of propositions that describes relationships between categories guides how categories relate to components of the paradigm model. How categories

relate to each other as well as to components of the paradigm needs to be interpreted in terms of the set of propositions (see Table 4.7) of the paradigm model in the research study. The relationships between components of the paradigm model therefore impact on the interpretation of relationships between categories guided by and inductively derived from the propositions of the paradigm model.

The paradigm model and set of propositions developed enables '*Web-based trust formation*' that was established as the core category to be interpreted as follows:

The formation of trust between the various partners in the virtual network is required to secure success in virtual organizing. The conditions of 'Web-driven supply chain co-operation', 'Web-driven value chain integration' and 'Supply chain shared e-commerce vision' are pre-requisites to 'Web-based trust formation'. The steps that will promote effective 'E-commerce information management' are influenced and conditioned by factors such as:

- '*Web-based customer focus*'
- '*Web-driven partner communication*'
- '*Web-driven partner learning*'

Due to the above intervening conditions, separately or together, steps introduced to enhance effective 'E-commerce information management' will only be successful where high levels of 'Web-based trust formation' exist. As a consequence, 'E-commerce oriented product delivery' may not be achieved satisfactorily.

The storyline of the research project formulates and describes the link between the categories and the central category as follows:

The enabling role of networking capabilities with virtual organizing highlights the importance of the formation of high levels of 'Web-based trust formation' between partners in the virtual network (partners include e-commerce customers

and virtual network value chain partners). Steps to support the formation of 'Web-based trust formation' include some of the other networking capabilities such as 'Web-driven supply chain co-operation', 'Web-driven value chain integration' and 'Supply chain shared e-commerce vision'. These very important networking capabilities serve as conditions that enable and enhance the achievement of the networking capability of 'Web-based trust formation'. The networking capability of 'E-commerce information management' is not only enabled but enhanced where the networking capability of 'Web-based trust formation' is achieved and implemented effectively. The intervening conditions for the networking capability of 'E-commerce information management' consist of the networking capabilities 'Web-driven customer focus', 'Web-driven partner communication' and 'Web-driven partner learning' that support the networking capability of 'E-commerce information management' to be effective and efficient. Consequently, the outcome of effective and efficient 'E-commerce information management' should enable and enhance the networking capability of 'E-commerce oriented product delivery' to be achieved. The implementation of networking capabilities in the virtual network not only enables virtual organizing but enhances its success in the e-marketplace.

The central explanatory concept of the research defined as '*Web-based trust formation*' enabled the categories to be organized around the central phenomenon in the preliminary framework. The narrative explanation of the paradigm model, consisting of nine categories, formed the basis for developing the preliminary framework around the phenomenon of networking capabilities that enable virtual organizing in virtual value networks.

'E-commerce oriented product delivery' emerged and was identified as the outcome of '*Web-based trust formation*' as the central category with '*Virtual information management*' considered to be the action/interaction strategy to reach the objective or outcome of '*E-commerce oriented product delivery*'. The storyline indicates the relationships between the various categories that enable insight into the role of networking capabilities used with virtual organizing. Such insight should result in the effective application of networking capabilities that not

only enable but enhance effective and efficient virtual organizing in a virtual value network of organizations. The propositions formulated which indicate relationships between categories of the paradigm model highlight the central importance of the phenomenon that enables effective and efficient virtual organizing.

The narrative explanation of the paradigm model implicates a structure or pattern in the use of networking capabilities with virtual organizing. The conditions associated with the use of networking capabilities in virtual organizing concern and relates to the propositions (see Table 4.7) of the paradigm model. Conditions refer to and describe 'general properties' [with dimensions] associated with the use of networking capabilities that causes subsequent related networking capabilities to be introduced in virtual organizing.

Conditions or consequences associated with the use of networking capabilities in virtual organizing are presented in Table 4.8. The new category and two sub-categories discovered in open coding of the empirical case data are included in Table 4.8.

Table 4.8 Conditions associated with successful use of networking capabilities

Category	Property	Dimensions
Web-driven value chain integration	<i>Web coordination</i>	<i>Innovative</i>
Web-driven customer focus	<i>Customer needs</i>	<i>Specified</i>
Supply chain shared e-commerce vision	<i>Consumer value creation</i>	<i>Focused</i>
Web-based partner trust formation	<i>Valued relationships</i>	<i>Established</i>
E-commerce information management	<i>Consumer needs</i>	<i>Predicted</i>
Web-driven supply chain cooperation	<i>Partner reaction</i>	<i>Real time</i>
Web-driven partner communication	<i>Lead time</i>	<i>Minimized</i>
Web-driven partner learning	<i>Innovation</i>	<i>Continuous</i>
E-commerce oriented product delivery	<i>Value creation</i>	<i>Innovative</i>

The grounded analysis of the literature case study led to the generation of the preliminary framework of networking capabilities used in virtual organizing illustrated in Figure 4.9.

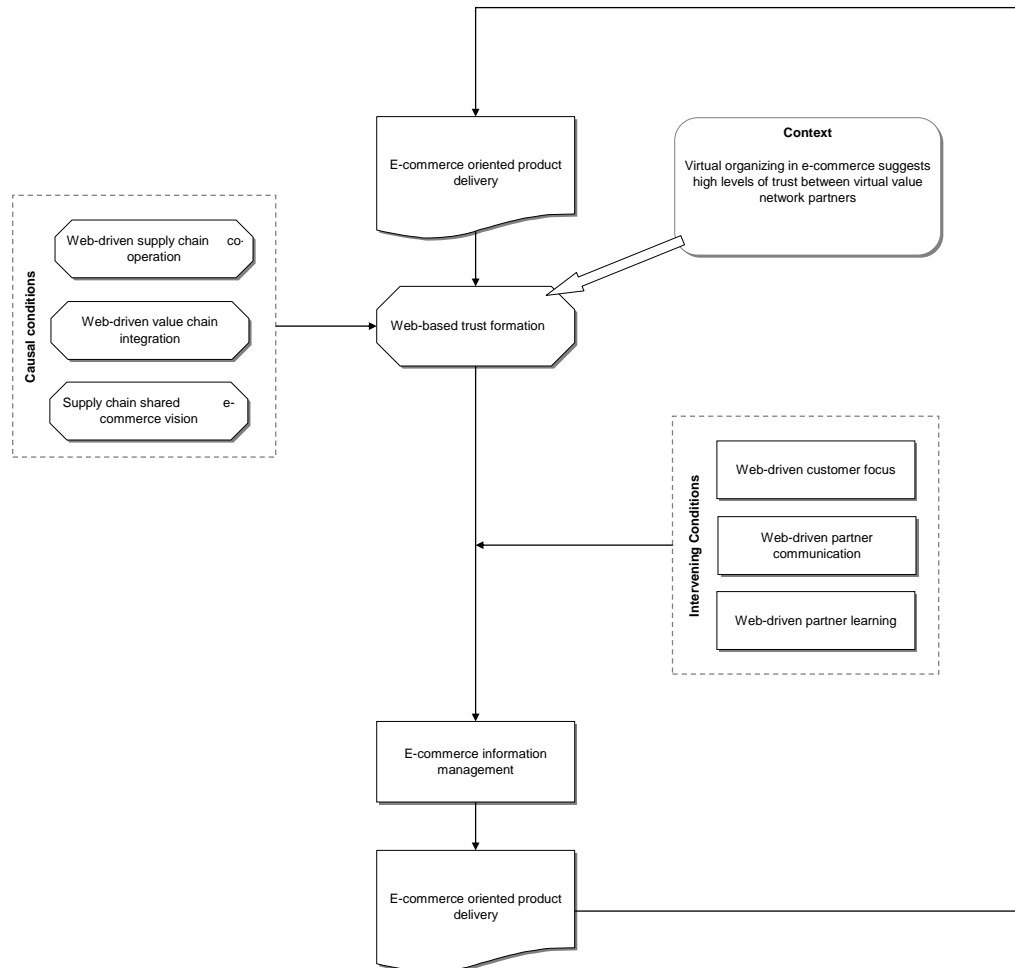


Figure 4.9 The preliminary framework

Figure 4.9 illustrates the preliminary framework that results from the integration of the categories identified in the open coding process. The preliminary framework indicates the relationship between ‘*E-commerce oriented product delivery*’ as the outcome or consequence of ‘*Web-based trust formation*’ (the central phenomenon of the study) as well as ‘*E-commerce information management*’ (the action/interaction strategy). Effective use of ‘*Web-based trust formation*’ skills enable and support the successful and effective use of ‘*E-commerce oriented product delivery*’ skills in virtual organizing. Effective use of ‘*E-commerce oriented product delivery*’ networking capabilities in turn enhances web-based

trust formation amongst partners thereby acting as a causal condition for ‘*Web-based trust formation*’ in the virtual value network of partners.

The preliminary framework of components with the propositions which indicate relationships between the categories enabled an emerging theory to be developed inductively from the data. The emerging theory developed in selective coding enables a better understanding of the impact of networking capabilities used in virtual organizing in a virtual value network of partners.

The story line of the paradigm model which explains the core category will now be developed further into a narrative description of the central category and phenomenon, i.e., ‘*Web-based trust formation*’ and the relations with the other networking capabilities used with virtual organizing in the virtual value network of partners.

Networking capabilities, with ‘Web-based trust formation’ of critical importance, are important to entrepreneurs in the global e-marketplace. An objective with the framework of networking capabilities is to develop a coordinated virtual network strategy for relational capabilities between virtual value chain partners. This should support the entrepreneur or network broker to control the entire web-based virtual network of organizations as well as the development of relational capabilities of all relevant members. The process, as from the initialization of the web-based organization, should be viewed as a flowing evolution with no particular goal although it is more importantly dependent on the commitment of the members of the virtual network as well as the needs of all relevant members to the value chain to be achieved. Relational or networking capabilities not only enable but should speed up processes and support better utilization of individual value chain member’s resources and competencies. This all is made possible because of the entrepreneur’s belief that the web-based organization that implements a virtual network of value chain partners, using virtual organizing, can better achieve its business vision.

Highly specialized and transferable resources are valuable for a virtual network, but cannot be put into full use without the capability of networking. Networking capabilities include abilities such as:

- *Web-driven supply chain co-operation*
- *Web-driven value chain integration*
- *E-commerce oriented product delivery*
- *Web-based trust formation*
- *Supply chain shared e-commerce vision*
- *E-commerce information management*
- *Web-driven customer focus*
- *Web-driven partner communication*
- *Web-driven partner learning*

The likelihood of success at virtual organizing can be increased if virtual networks of organizations implement the abovementioned networking capabilities. The term ‘networking capabilities’ suggest that certain abilities, although present in any organization, are being highlighted as being very important in a virtual network setting and their implementation is achieved differently in a virtual network setting. Networking capabilities are therefore considered to be of the utmost importance to entrepreneurs implementing virtual organizing in the virtual network of value chain members.

‘Web-based trust formation’ can only be developed to its full potential when ‘web-driven supply chain co-operation’ is efficient, ‘Web-driven value chain integration’ is effective and ‘Supply chain shared e-commerce vision’ is communicated in the virtual network of organizations. ‘Web-based trust formation’ is of the utmost importance to entrepreneurs to enable and secure effective virtual organizing in the virtual network. ‘Web-based trust formation’ also influences the relationships of the virtual organization with its customers in e-commerce. The outcome of ‘web-based trust formation’ is to enable the attainment of effective ‘E-commerce information management’ pertaining to not only the virtual network but also its e-

commerce customers. Effective 'E-commerce information management' is conditioned by networking capabilities such as 'Web-driven customer focus' that is in place, effective 'Web-driven partner communication' and 'Web-driven partner learning'. Effective and efficient 'E-commerce information management' impacts on the virtual network of value chain partners as well as on the e-commerce customers. In other words, due to the intervening conditions, separately or together, 'E-commerce information management' will be more effective. The term 'partner' relates to the organizations in the virtual network as well as customers in e-commerce. The consequence of effective 'E-commerce information management' is successful 'E-commerce oriented product delivery'. The relationship between 'E-commerce information management' skills and 'E-commerce oriented product delivery' skills is enhanced through the effective use of 'Web-based trust formulation' capabilities with virtual organizing in the virtual value network of partners. 'E-commerce oriented product delivery' should in turn enhance 'Web-driven trust formation'.

4.5 Implied contribution of the preliminary framework

The preliminary framework indicates the use and role of networking capabilities within virtual networks to be interlinked. The preliminary framework provides a unique and more holistic perspective on the implementation of networking capabilities in virtual organizing. The preliminary framework indicates how a holistic approach to the implementation and use of networking capabilities could enable more efficient and effective virtual organizing in the virtual value network. A holistic approach to the phenomenon of the study provides strategic value in support of the entrepreneur in his efforts to build and strengthen inter-relationships in the virtual value network of partners.

The various relationships that were established between networking capabilities in the preliminary framework necessitate the implementation of a process approach to their use in virtual organizing. A holistic view on the use of

networking capabilities is highlighted when steps are needed to secure effective '*E-commerce information management*'. If effective '*Web-driven customer focus*' is seen as the only networking capability that supports this objective, then the required use of networking skills pertaining to '*E-commerce information management*' may not be effective and the relevant virtual organizing activities may even be considered a failure. A more comprehensive approach would require that the mindset about '*Web-driven partner communication*' must also receive attention or it could be that there are no effective '*Web-driven partner learning*' capabilities in place. All members of the virtual value network need to implement and use relevant networking capabilities in virtual organizing to secure maximum impact for web-based business.

The preliminary framework indicates inter-relationships that exist between the identified networking capabilities although their arrangements must not be considered as final in its application. In other words, the interpretation of the preliminary framework must not be considered as concrete and to be the final argument. This can be illustrated by means of an example. Based on the underlying specifics of the particular segment in which a virtual value network of partners participate in electronic markets, a different networking capability may need to be considered as an intervening condition for '*E-commerce information management*' such as '*Web-driven value chain integration*'. If then, for example, '*Web-driven value chain integration*' is the intervening condition for '*E-commerce information management*' then '*E-commerce value chain integration*' may need to be refocused as a causal condition for '*E-commerce information management*' and not, for instance, '*Web-based trust formation*'. In this example, '*Web-driven customer focus*' may need to be refocused with '*Web-driven value chain integration*' and '*Supply chain shared e-commerce vision*' as causal conditions for '*Web-based trust formation*' in the virtual network.

Effective '*E-commerce information management*' secures and supports positive implementation of '*E-commerce oriented product delivery*' in e-commerce. '*E-commerce information management*' is influenced by '*Web-driven customer focus*', '*Web-driven partner communication*' and '*Web-driven partner learning*' as

important networking capabilities that impact on its successful use by partners of the virtual network in virtual organizing activities. Effective use of the abovementioned networking capabilities by the entrepreneurs means that time-consuming, expensive and difficult evaluation processes in order to improve '*E-commerce oriented product delivery*' are not required. If an evaluation of the networking capability, '*E-commerce oriented product delivery*', is still required, the process and steps to enhance its results must not lose sight of any of these factors.

The preliminary framework indicates the process for implementation of networking capabilities in virtual organizing to be interlinked in a cycle of events. Effective use of '*E-commerce oriented product delivery*' (i.e., is delivering value to the customer) impact on and enables more effective '*Web-based trust formation*' thereby supporting effective virtual organizing. This in turn increases the importance of '*Web-based trust formation*' to secure the desired outcome of effective '*E-commerce oriented product delivery*'. '*E-commerce oriented product delivery*' is vital in support and growth of '*Web-based trust formation*' that could lead to market leadership in e-commerce for the virtual network of organizations in a given segment of the global e-marketplace.

4.6 Summary

The Grounded Theory methodology guided the development of the preliminary framework. The preliminary framework explains and gives insight into the central phenomenon and the evolving use of networking capabilities with virtual organizing in a virtual value network. The paradigm model used in the study helped to explain the relationships between categories. The preliminary framework developed in this chapter indicates the relationships between categories identified in the open coding process from the literature case data. The preliminary framework is supported with a set of propositions where the

phenomena of the study are explained as statements of the relationships between the categories.

Strauss and Corbin (1998) indicate that findings of the study need to be verified throughout the research project. The preliminary framework as the outcome of the grounded analysis of the literature case enables the next step to be initiated in the research project. The next step involves the further development of the preliminary framework that enables more insight on relationships between and the use of networking capabilities in virtual organizing. The aim of Chapter Five is to develop a concluding framework with the objective to reach theoretical saturation of the study. Chapter Five employs six field studies in pursuit of its aim to arrive at the concluding framework.

Chapter 5

Developing the concluding framework

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5.1 Introduction

Strauss and Corbin (1990) indicate the importance of rendering ‘*the voice of the informants*’ into the results and findings of research. The purpose of Chapter Five is to describe the findings of the field studies that reflect on meanings people give to the phenomenon of the study in order to arrive at the concluding framework.

Data from the literature case provided theoretical grounding for the preliminary framework developed in Chapter Four. The analysis of data from the literature case assisted to minimize the risk of ‘*isolated theorizing*’ in the process of developing the preliminary framework. The preliminary framework enabled insight into the use of networking capabilities used with virtual organizing in the virtual value network of partners as well as the relationships between the networking capabilities identified. The motivation for implementing a literature case to develop the preliminary framework was to build on earlier academic work rather than to ‘reinvent the wheel’.

This chapter explains the procedure followed in the research project to refine and validate the preliminary framework developed in Chapter Four by means of the explanatory power of field studies in order to arrive at the concluding framework. Further refinement of developed theory or the theoretical framework is an explicit aim of the Grounded Theory method. Using the Grounded Theory approach empirical field study data will be analyzed in Chapter Five in order to confront findings of the preliminary framework. The field studies enable findings of the preliminary framework to be refined and validated in the research project in order to develop the concluding framework.

Theoretical sampling was used in the empirical studies to extend, develop and validate categories [with their properties] in order to further develop the preliminary framework of the study. Only after the data of each empirical field study had been analyzed would a decision be taken to proceed with the next empirical field study until theoretical saturation was reached – when only marginal improvement of categories were recorded. The research project

achieves the research objective of the study in Chapter Five. The research objective was formulated in Chapter Three as:

“To develop better understanding of the capacity of networking capabilities to not only enable, but to enhance, effective and efficient virtual organizing in a virtual network of organizations”.

It is important to consider how theory is defined in the context of Grounded Theory. Hallberg (2006) relates to Strauss and Corbin (1990, 1998) when stating that ‘*theory concerns carefully developed concepts that are put together by statements about mutual relations forming an integrated conceptual framework that explains or predicts a phenomenon or an event, and thereby provides guides to action*’. The use of Grounded Theory to develop the concluding framework with its statement of categories and relationships is considered to be substantive theory.

The Grounded Theory procedure implemented in the research to develop the concluding framework is illustrated in Figure 5.1.

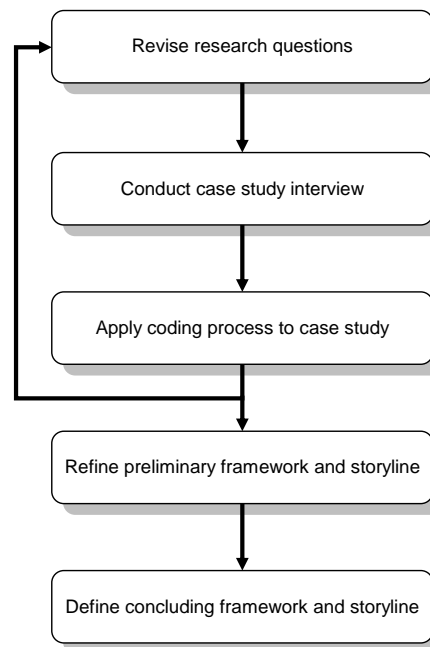


Figure 5.1 The focus of Chapter Five

Chapter Three indicated that data for the research would be organized into seven case studies that included a literature case study, the latter being used in Chapter 4 for the development of the preliminary framework.

The use of the literature case and field studies in the process of research is shown in Figure 5.2.

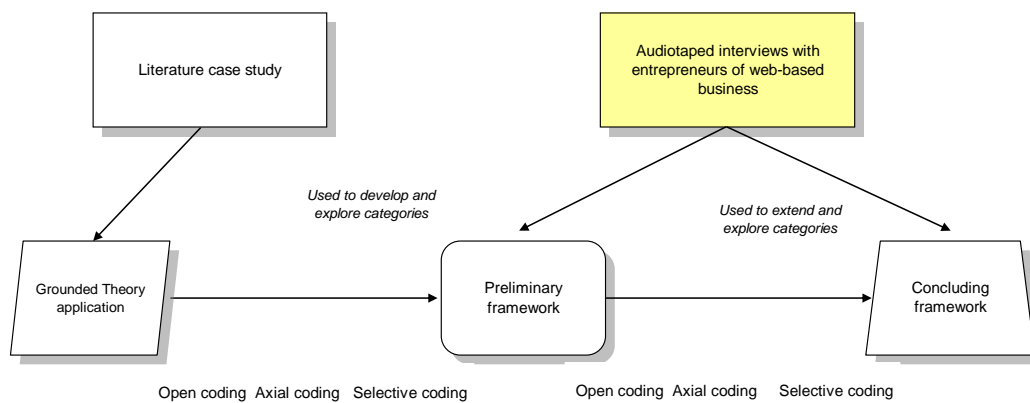


Figure 5.2. Role of literature case and field studies in the sequence of research

The data collected in the empirical field studies was analysed to extend and explore categories and relationships explained in the storyline of the preliminary framework. The data collection method employed in the empirical field studies was individual interviews. Details of the individual interviews conducted are given in Table 5.1.

Table 5.1 Individual interviews as the data collection method in empirical cases

Individual interviews
<p>Individual semi-structured interviews with the directors of 6 different web-based organizations in Gauteng, South Africa. Interviews lasted from 1 hour to 1 hour 30 minutes, were recorded and then transcribed. A follow-up [semi-structured] interview was conducted with one of the 6 directors which lasted an hour, was recorded and then transcribed.</p> <p>Respondents had been selected to mirror the diversity of sectors active in e-commerce in terms of geographical location, previous professional experiences and length of period participating in e-commerce as web-based organizations using a virtual network of partners.</p>

The transcribed interviews were subjected to coding using the Grounded Theory approach as explained in Chapter Three.

5.2. The field studies

All the field studies were performed in the private sector within the province of Gauteng, South Africa, in 2004 and 2005. The companies all function as web-based organizations implementing virtual networks of value network partners in e-commerce. The entrepreneurs were asked if they had implemented virtual networks of partners in conducting business in the e-marketplace and whether they would be willing to participate in the research. The criteria for inclusion in the research were that the entrepreneur had used virtual organizing in the virtual network of partners over a period of at least a year. The interviews were all transcribed and formed the basis of the Grounded Theory analysis.

Semi-structured, in-depth individual interviews were conducted in the offices of the directors. The low-level basic questions designed in Chapter 3 guided the conversation. The exploratory [low-level basic] questions of the study were used

to keep the interview on topic, and served to link the low-level basic questions of the individual interviews to the overall research design. Probes were used during interviews to get more clarity on themes considered incomplete or that lack depth. Transcripts of interviews are included in Annexure 2 of the research.

During the interviews, and based on the low-level basic research questions developed in Chapter Three (see Table 3.4), certain themes were explored with participants. These themes are listed in Table 5.2.

Table 5.2 Themes explored during the interviews

Interview themes
Web-driven supply chain co-operation
Web-driven value chain integration
E-commerce oriented product delivery
Web-based trust formation
Supply chain shared e-commerce vision
E-commerce information management
Web-driven partner communication
Web-driven partner learning
Web-driven customer focus

The iterative approach to the field studies involves the use of an ongoing cyclical process of collecting and analyzing data for concepts implementing the coding process of the Grounded Theory methodology and testing against the existing preliminary framework. Data analysis and testing may indicate a need to change the approach to the questions used. Data analysis and testing may also indicate the need to incorporate different field studies and may potentially impact on the

number of field studies included in the research project. Each additional interview would only proceed after completion of previous data analysis. Several iterations of the process of data collection and analyzing enabled the development of the concluding framework with a statement that fits the interview data representing the experiences and understandings of the interviewees.

The implementation of data collection and data analysis in the field studies are illustrated in Figure 5.3.

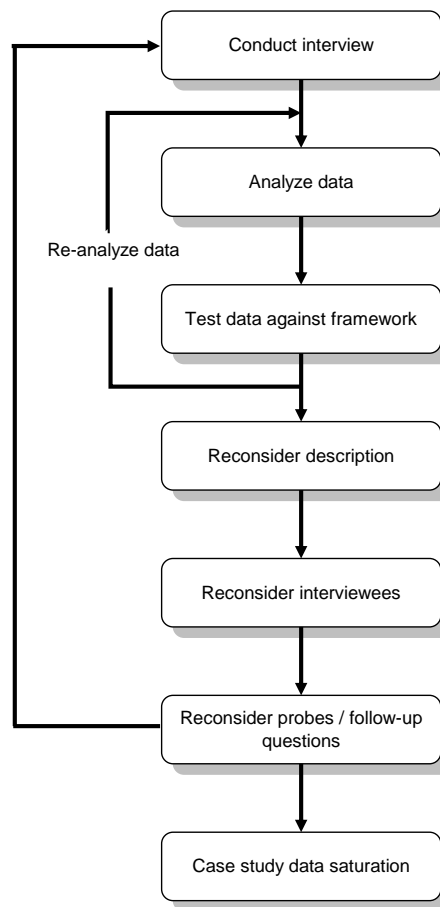


Figure 5.3 Iterative approach to data collection and analysis

Flexibility in the use of questions is important in order to focus subsequent interviews on emerging new ideas and themes. Semi-structured interviews

enabled the exploration of concepts with a certain amount of focus while ‘probes’ were used to clarify answers. Follow-up questions used in the interview enabled richer in-depth answers to be obtained from the interviewees.

Six field studies have been conducted and the characteristics of the individuals in the field studies are listed in Table 5.3.

Table 5.3 Characteristics of participants

	Type of product / service	Title	Previous activities	Educational background
Study 1	Marketing and strategic services	Director	Development coordinator	Engineering/ Computer Science
Study 2	Electronic products	Director	Senior developer	Computer Science, Programming
Study 3	Electronic products and information services	Director	Senior management in related sector	Computer Science, Accountancy
Study 4	On-line trading	Executive Director	Development coordinator	Computer Science
Study 5	Oil and chemical products	Director	Development coordinator	Engineering
Study 6	Books, magazine, music	Executive Director	Development coordinator	Natural science

The data was gathered from the directors of six companies that participate as businesses with virtual supply networks. The six companies are involved in different sectors of the e-marketplace. The web-based firms used in the field study are very successful with the second firm considerably smaller than the

other two in terms of its annual turnover. The fifth field study is the strongest listed company in South Africa while the other two are medium-size web-based businesses. The six web-based firms are described below. In further references to them the abbreviations EC1, EC2, EC3, EC4, EC5 and EC6 are used.

A. Field study 1

Field study 1 is a small web-based organization based in Pretoria. This organization implements independent virtual partners to conduct all software development activities, product and service implementation, while strategic marketing is also outsourced to independent partners in the value chain. The organization conducts all its business activities in e-commerce and has been successful over a period of three years.

The virtual value network consists of partners (project manager/integrators), software developers from across South Africa, clients in the greater Gauteng region, and the actual web-based business that provides and manages virtual organizing as well as marketing activities through its web-site. The interview was conducted with a director in the organization responsible for the virtual organizing activities in the virtual network of partners. The interview concentrated on topics related to networking capabilities that enable virtual organizing.

B. Field study 2

Field study 2 is a small web-based business situated on the East Rand in Gauteng, South Africa. This company sells a wide variety of electronic products (of well-known international brand names) pertaining to business needs. All manufacturing, delivery, inventory, and marketing services are conducted by means of a virtual network of partners.

The company mostly attracts customers in South Africa and more specifically in Gauteng, South Africa. The organization conducts all its business activities in e-commerce and has been successful over a period of more than a year. The company is the sole provider of all computer hardware and software packages of

a local industrial concern that provides a consistent stream of income. The company has not been particularly successful to attract the interest of households and focuses their effort in electronic commerce to expand business activities in the local industrial sector. The interview was conducted with a director in the organization responsible for virtual organizing activities in the virtual network of partners. The interview concentrated on topics related to networking capabilities that enable virtual organizing.

C. Field study 3

Field study 3 is a small web-based company situated in Sandton, Johannesburg. This organization implements an independent virtual network of partners to conduct all software development activities, product and service delivery and service development and offering activities. All electronic products offered in e-commerce are supplied by internationally well-known brand names, delivered in some instances by the manufacturer or an independent service. The organization conducts all its business activities in e-commerce and has been successful over a period of more than two years.

The interview was conducted with a director in the organization responsible for virtual organizing activities in the virtual network of partners. The virtual value network includes retailers, customers, transport companies (although only one is used), manufacturers and the web-based firm that participate in electronic commerce. The interview also focused on the topic of needed networking capabilities in virtual organizations in general and their contribution to enable virtual organizing.

D. Field study 4

Field study 4 is an international financial trading institution that provides in spread trading and 'contract for difference execution' only service. It was founded in 2000 with a global reach into South Africa, North America and Asia. The company conducts trades worth over \$7 billion per annum for clients in 26

countries. The company manages investments of institutional and private clients in international and domestic financial markets.

The company implements a multi-currency, multi-instrument online trading system that is managed from Melrose Arch, Johannesburg. The trading activities is done in London with various charting software packages developed and maintained in the UK. Various banking institutions including Deutsche Bank provide trading information while external information resources including Reuters and Bloomberg provide trading data. The company offers trading products that include spread trading utilizing 'contract for differences', on fixed income, equity, commodity and foreign exchange markets with Internet-driven real-time trades.

The interview was conducted with a director in the organization responsible for virtual organizing activities in the virtual network of partners. The interview focused on virtual organizing in the virtual value network of partners.

E. Field study 5

Field study 5 is an integrated oil and gas company with substantial international chemical interests. The JSE listed company was formed in 1950 and employs over 31 000 people worldwide. The company, situated in Rosebank, Johannesburg, uses virtual organizing with their chemical manufacturing and marketing operations that span the globe. The virtual value chain used in the company's chemical cluster includes plants in USA and Italy while resources are obtained from all over Africa. Products are distributed through partners in countries such as China, Malaysia and America. The interview was conducted with a director in the organization responsible for innovation and systems in 2003. The interview also focused on the topic of needed networking capabilities used with virtual organizing.

F. Field study 6

Field study 6 is a well-known South African web-based electronic business that sells books, magazines, music cd's, dvd's and a variety of other related products in electronic commerce. The web-based business has been very successful in developing their brand name in South Africa. Their website provides book reviews, library facilities and book ordering functions amongst others with a distinctly South African approach.

The firm has joint forces with a financial banking institution in South Africa that enables customers to use credit funds, earned from individual banking transactions that may be used to buy their products online. This approach to electronic business has proved to be very successful with marketing benefits gained from the joint venture with the local financial banking institution. Their customer base is mostly limited to individual clients and institutions from Southern African countries. The outlook for electronic business in South Africa is limited by the fact that a large section of the population has no access to the internet although prospects are improving due to reduced internet costs.

Demographic information of the six field studies is provided in Table 5.4. Apart from the one field interview [Field study 5, performed in July 2008] the remainder of the field interviews took place in the period 2003 until 2004.

Table 5.4 Demographic information of field studies

Interview	Respondent position in virtual organizing	Responsibilities with regards to virtual organizing	Organization type	Sector	Personnel	Estimated number of national customers
1	Manager	Web-interface and systems	Central	Information Technology	4	100 %
2	Manager	Web-interface and systems	Central	Electronic goods retail	2	100 %
3	Manager	Web-interface and systems	Central	Software development	3	100 %
4	Manager	Strategy and implementation	Functional	Trading	55	100 %
5	Manager	Strategy and implementation	Matrix	Petro-chemical	150	30 %
6	Manager	Strategy and implementation	Hierarchical	Books	54	90%

The above six field studies made valuable contributions to further develop and refine concepts and categories of the preliminary framework. The further development of the existing research questions is considered in the next subsection. We reconsider the research questions in order to improve on it with the promise that enhanced research questions may contribute to obtain more value from the field studies.

The next section discusses theoretical sampling of the field study data.

5.3 Theoretical sampling of field study data

Theoretical sampling of field study data includes simultaneous data collection, coding and analyzing in order to develop the concluding framework of the study. The continuous and systematic analysis of the field study data is aimed at refining the preliminary framework to arrive at an enriched theoretical framework that explains the phenomenon of the study. Individuals included in the field studies were selected based on their potential to deliver valuable information to test and refine emerging categories. The analysis of the empirical case data aims to develop, elaborate and saturate categories of the preliminary framework in order to arrive at the concluding framework. Analysis of the empirical case data enables variation in relation to existing concepts of the literature case data to be discovered as well as to further develop and refine categories of the preliminary framework in terms of their properties and dimensions.

The preliminary framework indicates the key categories with storyline that explains the relations established from the literature case data. Theoretical sampling enables the researcher to develop and create density as well as to saturate categories of the preliminary framework in order to arrive at a well-developed theoretical framework (Strauss and Corbin, 1998, p. 203). New data needs to be collected from individuals in field studies to reach theoretical saturation. Theoretical saturation is achieved when the categories and relations between categories are fully described and no new information is forthcoming from individuals used in the field studies. In other words, no additional information is forthcoming from the field study data.

The Grounded Theory methodology specifies theoretical sampling and data analysis to happen in sequence in order for data analysis to guide the process of data collection (Strauss and Corbin, 1998, p. 203). The constant comparison method of Grounded Theory is of central importance when analyzing field study data. This approach considers the relevance of field study data by looking for similarities and differences. Constant comparison of field study data allows for

new concepts to be discovered, new relationships between categories to be identified while properties of categories also need to be reviewed. In other words, all concepts that are discovered in the field study data are compared with the literature case data in order to identify similar as well as different concepts.

The research questions developed in Chapter Three are used in the coding processes of the Grounded Theory methodology. The various categories of questions developed in Chapter Three are presented in Table 5.5.

Table 5.5 Research questions of the study

Name	Description	Use in research study
A Exploratory questions	Low-level basic research questions	Used in process of data collection and data analysis as well as with the coding activities in the Grounded theory method
B Meta questions	Refined higher level and more specific questions developed from exploratory questions	Used to develop the main research questions and narrow the focus of the study
C Main questions	Higher level interpretation of meta questions	Used to develop the fundamental research question
D Fundamental research question	Fundamental research question of the study inferred from main research question	Give flexibility and freedom to explore a phenomenon at depth when developed in a bottom-up process

Since the research questions were formulated prior to the development of the preliminary framework, the questions may need to be modified after the development of the preliminary framework (Strauss & Corbin, 1998, p. 78). The low-level basic research questions in addition serve to focus the coding processes of the Grounded Theory methodology. The low-level basic research questions (see Table 5.5) developed in Chapter Three were revisited to determine whether they were narrowed down sufficiently yet broad enough to allow flexibility in collecting and analyzing empirical field data. The low-level basic

research questions proved effective in focusing the coding processes of Grounded Theory methodology in the development of the preliminary framework of the study. Based on previous experience and results from the use of low-level basic questions in the development of the preliminary framework it was decided against further refinement or introduction of new low-level basic research questions.

The low-level basic research questions were used during the interviews as well as during the processes of collecting, analyzing and coding empirical field data of the study. The low-level basic questions developed in Chapter Three are listed in Table 5.6.

Table 5.6 Low-level basic questions formulated using the process-based approach

'What is?' perspective	'How does?' perspective
What is the enabling role of networking capabilities?	How does the framework of networking capabilities impact on the virtual network?
What is the role of networking capabilities in the virtual network?	How does the framework of networking capabilities impact on the role of the entrepreneur in the virtual network?
What is the relation between virtual organizing and networking capabilities?	How does the framework of networking capabilities enhance activities of virtual organizing?
What situations highlights the need for networking capabilities?	How does the virtual network implement networking capabilities?
What is the inter-relationship between the various networking capabilities?	How do networking capabilities fit into the activities performed by the entrepreneur?
In what way can networking capabilities not only enable but enhance effective and efficient virtual organizing?	What considerations guide the implementation of networking capabilities?
'Why is?' perspective	'How should?' perspective
Why does a virtual network needs to implement networking capabilities?	How should the entrepreneur implement the framework of networking capabilities?
Why do networking capabilities tend to enhance virtual organizing activities?	How should the entrepreneur develop networking capabilities of partners in the virtual network?
Why does the entrepreneur need networking capabilities in the virtual network?	How should the virtual network of partners approach the issue of networking capabilities?
Why do networking capabilities promote improved virtual organizing? Why do networking capabilities promote improved virtual organizing?	How should the implementation of networking capabilities to enhance effective and efficient virtual organizing be secured?

The low-level basic research questions are similar to '*guiding questions*' referred to in Grounded Theory methodology that guide interviews and analysis of field study data of the study (Strauss and Corbin, 1998, p. 78). The use of questions during the coding process supports theoretical sampling of the empirical case data and the constant comparison principle of the Grounded Theory methodology.

5.4 Hierarchical process of coding of the field study data

Each step in the process of coding will be discussed next. The findings of the coding process of the field study data will then be analyzed in relation to the preliminary framework developed in Chapter Four. The existing propositions of the preliminary framework need to be reconsidered, to be revised if necessary, whereas new propositions generated must also be included in the development of an enriched theoretical framework with its explanation of the relations between categories and sub-categories. Empirical case data was used to refine existing categories and sub-categories of the preliminary framework, to develop new categories and sub-categories as well as to refine and develop new propositions in the study.

The process of open coding of the empirical case data is discussed first.

5.4.1 Open coding of the empirical case data

The process of open coding, illustrated in Figure 4.2, was implemented with the field study data. The transcripts of each interview were analyzed when the validated copy was obtained. The process of open coding enables data analysis of data collected from field studies. Transcripts of each interview need to be reviewed and validated with the preliminary framework developed in Chapter Four. Each line of the transcript is reviewed in the process of open coding. The exploratory questions generated in Chapter Three were used in the process of open coding to develop as well as validate new and existing concepts of the preliminary framework. The use of analysis worksheets as in Chapter Four (See Exhibit 4.1) also applies to the field study data analysis. The worksheets of the process of open coding of the field study data in Chapter Five are listed in Annexures 2 and 3. New concepts identified from the field study data are used to

refine existing categories and develop new categories based on new insight gained on the phenomenon of the study. The new insight gained [through the use of low-level basic research questions] was presented in more abstract explanatory terms in the development of the concluding framework with storyline of the study. New concepts identified were first considered for inclusion in existing categories of the preliminary framework. The properties and dimensions of each existing category were revised to incorporate related new concepts with its own label. Where a sufficient number of new and unrelated concepts were identified that did not fit any of the existing categories of the preliminary framework, a new category would be established with a label. Each new category was refined in terms of properties and dimensions to be considered for inclusion in the concluding framework.

The process of open coding yielded three new categories to be included in the concluding framework. The three categories did not match any of the existing categories of the preliminary framework thereby creating the opportunity to further develop and enrich the concluding framework in order to create deeper understanding of the phenomenon of the study. The new categories with their relevant properties and dimensions are listed in Table 5.7.

Table 5.7 New categories identified in open coding of field study data

Category and Concepts	Properties	Dimensions
Ability to act as network broker <u>Concepts</u> <i>Information capture and sharing</i> <i>Virtual network structuring</i> <i>Virtual organizing structuring</i>	<ul style="list-style-type: none"> - Information seeker - Communicator - Pragmatist 	Incompetent to Effective
Knowledge of co-operative agreement <u>Concepts</u> <i>Network configuration</i> <i>Network interest capturing</i> <i>Virtual co-operation agreement structuring</i>	<ul style="list-style-type: none"> - Organizational knowledge - Specialist positioning - Information technology infrastructure - Legal arrangements 	Poor to Good
Virtual network conflict resolution <u>Concepts</u> <i>Open-end information communication</i> <i>E-partner information integrity</i> <i>E-partner open-end communication</i> <i>E-customer global segmentation</i> <i>E-partner business process insight</i>	<ul style="list-style-type: none"> - Conflict identification - Conflict management - Trust enhancement - Network communication enhancement 	Dispersed to Integrated

There was no need to revise properties and dimensions of the categories of the preliminary framework. The open coding process of the field study data enabled

theoretical saturation to be achieved that relates to all the categories of the preliminary framework. The new concepts identified through open coding of the field study data had no impact on existing properties and dimensions of the categories included in the preliminary framework of the research.

The next step involved field study data to be re-analyzed in order to identify sub-categories and their inter-relationships with existing categories in the process of axial coding.

5.4.2 Axial coding of the empirical case data

The axial coding process allows for empirical case data to be re-analyzed conceptually. The process aims to identify conditions, actions/interactions and consequences associated with existing and new categories. The paradigm model was again used as the means to consider all new categories discovered in the process of open coding to be incorporated into an enriched conceptual framework. Each category/sub-category generated from the empirical case data is related to categories of the preliminary framework that describe the phenomenon of the study. There was no change in the core category of the preliminary framework and the paradigm model was validated around the core category '*Web-based trust formation*' of the literature case data. Axial coding of the empirical case data enabled the three new categories to be incorporated into the concluding framework with existing categories of the preliminary framework.

The three new categories that were identified during open coding (see Table 5.7) of empirical case data are defined in Table 5.8.

Table 5.8 Definitions of new networking capabilities

Virtual network conflict resolution	Collective capability to identify, define and align seemingly incompatible goals in the virtual value network of partners.
Ability to act as network broker	Ability to demonstrate and use relevant networking capabilities that facilitate and promote inter-relationships in the virtual value network of partners.
Knowledge of co-operative agreement	The ability to define security and legal concerns, with the intention to create a basis for co-operation amongst legal entities.

Axial coding of the empirical case data enables the three new categories to be related to existing categories in order to determine the impact on inter-relationships of the preliminary framework. The process that enables each of the three new categories to be incorporated into the preliminary framework will be discussed next. Inclusion of the three new categories into the paradigm model enables the impact of changes in existing propositions to be incorporated in the storyline of the concluding framework.

The first new category to be developed in the process of open coding that needs to be incorporated in the paradigm model was labelled '*Ability to act as network broker*'. The category was related to the '*Web-driven trust formation*' category which is the core category of the preliminary framework. '*Ability to act as network broker*' was found to be a sub-category of '*Web-driven trust formation*'. The '*Ability to act as network broker*' specifies '*Web-driven trust formation*' further and serves to extend the context of the concluding framework. This requires that the proposition describing the relationship between '*Ability to act as network broker*' and '*Web-driven trust formation*' be updated to: *High levels of trust formation require the function of the network broker to be effective.*

The second new category was labelled '*Knowledge of cooperative agreement*'. This category was related through the application of the axial coding steps to the core category namely '*Web-driven trust formation*' since it differentiates on '*Web-driven trust formation*'. The proposition, describing the relationship between '*Web-driven trust formation*' and '*Knowledge of cooperative agreement*' can be updated as follows: *Effective Web-driven trust formation is enhanced where partners and the entrepreneur in the virtual networks understand and implement the capability to develop cooperative agreements that secure the interest of all participants.*

The third new category was labelled '*Virtual network conflict resolution*'. This category was related through the application of the axial coding steps to the core category. The new core category '*Virtual network conflict resolution*' is considered to be a causal condition to '*Web-driven trust formation*'. The proposition, describing the relationship between '*Web-driven trust formation*' and '*Virtual network conflict resolution*' reads as follows: Efficient web-driven '*Virtual network conflict resolution*' supports the formation of '*Web-driven trust formation*' for effective virtual organizing.

When participants discussed the use of networking capabilities in virtual organizing they would constantly raise concerns about legal relationships with partners in the virtual value network. Risk is interwoven with trust that partners need to embrace and display in inter-relationships in the virtual value network.

In the following discussion abbreviations are used when referring to interviewees, namely, I1, I2 and I3.

One of the interviewees expressed the importance to integrate business processes indicating that '*the business partners must accept that business processes must be integrated. I need these guys to show commitment to us We need to share goals and policies in the supply chain regarding our product that we deliver in e-commerce.*' (I2). One participant viewed product delivery in electronic commerce to be linked with trust formation based on the view expressed in the interview that successful attainment of policy of virtual value

network impacts on product delivery and after-sales service. Another interviewee was more concerned with the “*lack of availability of a legal framework*” (I3) and the impact it had in creating the virtual value network of partners. The interviewees were also concerned with warranties and liability issues of e-business activities in electronic commerce. Another issue emphasized in the interviews was the importance of legal contracts indicating that business commitments necessitate use of legal contracts in the virtual value network:

“My first venture in electronic commerce was a big failure, of course. It was my first attempt really and I was always very interested in all this...well... the whole concept.... Things could have been better if I made sure of the legal relationship between all my partners... I mean... that was what people talked about... but I never had any idea of its importance” (I1).

The participants also provided valuable insight on what they considered to be the important role of the entrepreneur in the success of the value network in electronic markets. An important consideration for them relates to the entrepreneur as the responsible partner in the virtual value partner to ‘*recognize the market opportunity in e-commerce*’ (I1) that the virtual value network can serve best. The ability of the entrepreneur to enhance collaboration in the supply network is considered essential for the success of the virtual value network since it ‘*enables greater success of integrating the partners in a business unit*’ (I2). The network broker is considered ‘*responsible for product delivery by the customer*’ (I1) in electronic markets that relates to the critical role of the entrepreneur in the supply network. The entrepreneur performs a critical role in all aspects of the virtual value network:

I am the responsible person for everything...I must assemble the team that can make the right inputs in the product that we deliver... but not every business is suitable for my needs... The quality of my product offering is very important to me ... also.... the product delivery” (I3).

The participants furthermore expressed reservations on the ability of the virtual value network to successfully deal with conflict in electronic markets. The

importance of conflict resolution by the network broker to ‘*strengthen inter-relationships*’ (I2) and his/her ability to promote ‘*future dealings*’ (I2) with partners were confirmed by participants. The presence of conflict was considered to be a major source of risk where the entrepreneur needs to manage conflict in the virtual value network:

“I deal with conflict situations on a daily basis... whether in the supply chain or with our customers. I know the risk of not dealing with conflict situations. The lost of one customer may have a spiral effect... not to mention if I should lose a supplier in the supply chain. They are the best in their trade... they understand e-commerce... I cannot afford to lose any of them” (I1).

Another participant put emphasis on the potential rewards of successful risk resolution in the virtual value network that includes ‘*strengthened relationships*’ (I3) and ‘*learning opportunities for our partners*’ (I3) in the virtual value network.

The incorporation of the three new categories in the paradigm model impacts on the relations described in Chapter Four. New categories necessitate new relationships to be specified as well as validated. New propositions developed that describe relationships of the new components included in the changed paradigm model, with relevant validation in the empirical case data, are listed in Table 5.9. Field studies 4, 5 and 6 have not been included in the development of new propositions since they did not deliver significant additional insight.

Table 5.9 Additional propositions of the updated paradigm model

Propositions	Supported by EC1	Supported by EC2	Supported by EC3
High levels of trust formation require the function of the network broker to be effective.	Explicitly	Explicitly	Explicitly
Effective web-driven trust formation is enhanced where enterprises in the virtual organization's knowledge levels of co-operative agreement is high.	Implicitly	Explicitly	Implicitly
Efficient web-driven virtual network conflict resolution supports the formation of Web-driven trust formation for effective virtual organizing.	Explicitly	Explicitly	Explicitly

EC_i = Empirical Field Study data for field study *i*

The three new categories impact on relationships of the previous paradigm model. These changes are depicted in Figure 5.4. The changed model indicates the two new sub-categories '*Ability to act as network broker*', '*Knowledge of cooperative agreement*' and '*Virtual network conflict resolution*' in relation to existing categories of the previous paradigm model.

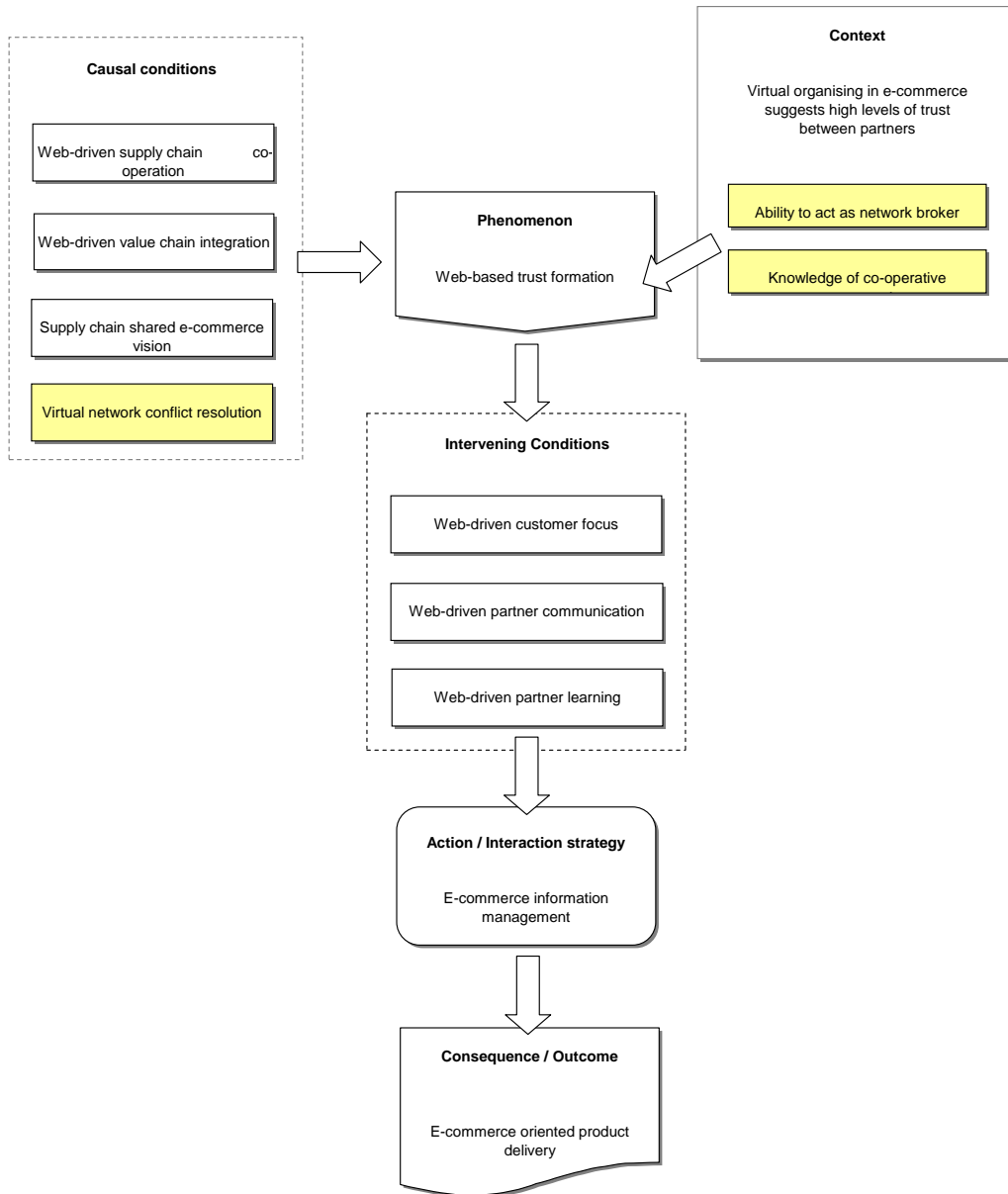


Figure 5.4 Changes to the paradigm model

To summarize, the application of open and axial coding to the three empirical cases resulted in the identification of three new categories of which two categories are considered to be sub-categories. They reached an acceptable level of theoretical saturation based on marginal improvement of categories that was achieved with data from the third empirical case of the study.

These categories were incorporated into the paradigm model indicating the causal relationships between categories and how they relate to each other. The resulting changes to the paradigm model are shown in Figure 5.4.

The final coding process in data analysis of Grounded Theory, namely, selective coding, aims to establish a concluding framework through validation of the core category and further refinement of the existing concepts and categories.

5.4.3 Selective coding of the empirical case data

The story-line of the preliminary framework needs to be refined in the selective coding process in order to arrive at the concluding framework of the study. As explained in Chapter Four, the story-line is a conceptual description about the phenomenon being studied. The refined storyline of the changed paradigm model is as follows:

Successful implementation of virtual organizing suggests effective ‘Web-driven trust formation’ as the core enabling networking capability.

The importance of effective ‘web-driven supply chain co-operation’, ‘Web-driven value chain integration’, ‘Supply chain shared e-commerce vision’ and ‘Virtual network conflict resolution’ acts not only as causal conditions but enables efficient ‘Web-based trust formation’.

The above-mentioned networking capabilities as well as the ‘Ability to act as network broker’ and ‘Knowledge of cooperative agreement’ necessitate successful ‘Web-based trust formation’ in the virtual network of value chain partners. The outcome of ‘Web-based trust formation’ is effective ‘E-commerce information management’ pertaining not only to the virtual network of partners but also to e-commerce consumers. Effective ‘E-commerce information management’ is conditioned by networking capabilities such as effective ‘Web-driven customer focus’, ‘Web-driven partner learning’ and ‘Web-driven partner

communication. These intervening networking capabilities enhance and contribute to more efficient and effective ‘E-commerce information management’.

‘E-commerce information management’ enables more successful ‘E-commerce oriented product delivery’ in e-commerce. The attainment of effective and efficient ‘E-commerce oriented product delivery’ in e-commerce contributes to the creation of ‘Web-based trust formation’.

Relationships between existing and new components (networking capabilities) of the new paradigm model with propositions that describe the new or changed relationships are presented in the concluding framework of the study. The concluding framework is illustrated in Figure 5.5 to be discussed in Section 5.5.

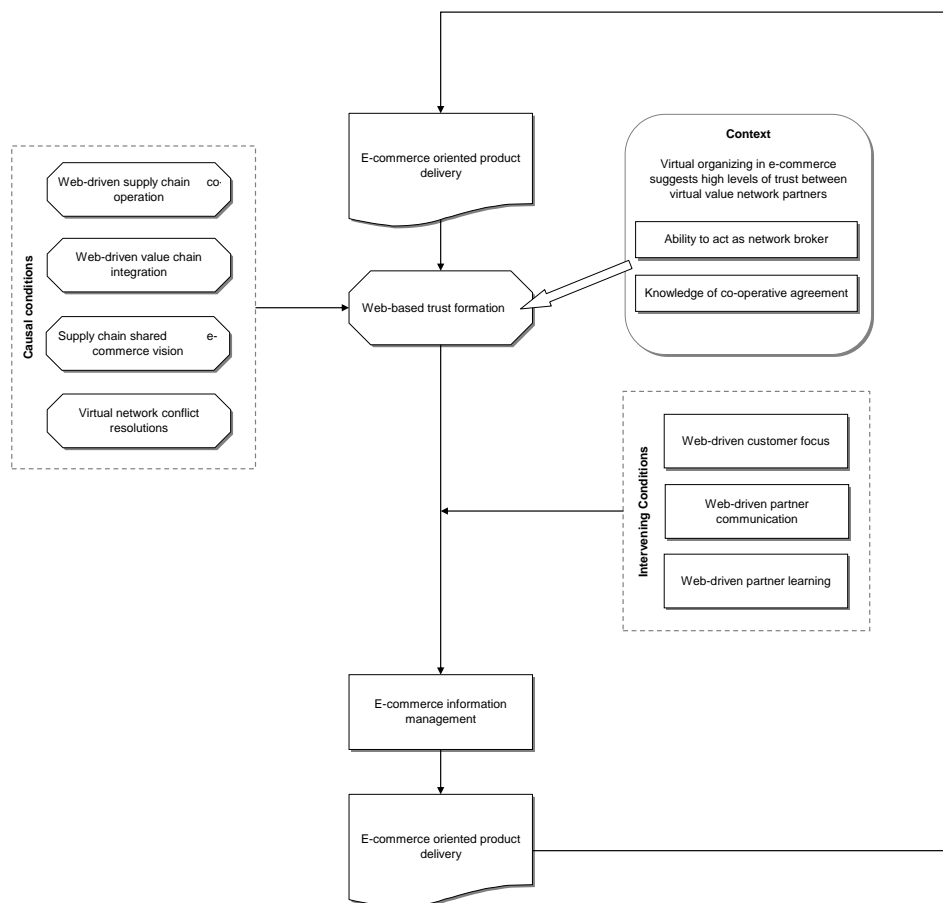


Figure 5.5 The concluding framework

The concluding framework consists of components (networking capabilities) arranged in a specific structure that indicates relationships in the use of networking capabilities with virtual organizing in the virtual value network of partners.

Specific conditions or consequences [in terms of dimensions and properties of categories] are associated with the successful use of networking capabilities in virtual organizing. Such use of networking capabilities indicates specific patterns of use.

The conditions associated with the successful use of the new category and sub-categories [developed during open coding of the empirical case data] relates to the propositions developed (see Table 5.8). The complete and updated list of conditions associated with the successful use of networking capabilities are listed in Table 5.10.

Table 5.10 Conditions associated with successful use of networking capabilities

Category	Property	Dimensions
Web-driven supply chain integration	<i>Web coordination</i>	<i>Innovative</i>
Web-driven customer focus	<i>Customer needs</i>	<i>Specified</i>
Supply chain shared e-commerce vision	<i>Customer value creation</i>	<i>Focused</i>
Ability to act as network broker	<i>Entrepreneurial skills</i>	<i>Developed</i>
Knowledge of cooperative agreement	<i>Legal knowledge</i>	<i>High</i>
Web-based partner trust formation	<i>Valued relationships</i>	<i>Established</i>
E-commerce information management	<i>Consumer needs</i>	<i>Predicted</i>
Web-driven supply chain cooperation	<i>Partner reaction</i>	<i>Real time</i>
Web-driven partner communication	<i>Lead time</i>	<i>Minimized</i>
Virtual network conflict resolution	<i>Conflict management</i>	<i>Effective</i>
Web-driven partner learning	<i>Innovation</i>	<i>Continuous</i>
E-commerce oriented product delivery	<i>Value creation</i>	<i>Innovative</i>

An additional three propositions have been developed during the axial coding process of the empirical cases (see Table 5.9). The complete set of propositions of the concluding framework is presented in Table 5.11. The table presents propositions of the preliminary framework (see Table 4.7) as well as the additional three propositions of the updated paradigm model. The three new propositions of the updated paradigm model had no effect on established relationships of the preliminary framework.

Table 5.11 The final set of propositions that describe relationships between the components of the concluding framework

Propositions	
1	Successful e-commerce oriented product delivery supports more effective web-based trust formation
2	Web-driven supply chain cooperation use with virtual organizing supports effective web-based trust formation
3	Successful web-driven value chain integration with virtual organizing supports effective web-based trust formation
4	Supply chain shared e-commerce vision supports web-based trust formation in virtual organizing
5	Web-based trust formation enhances effective e-commerce information management in virtual organizing
6	The achievement of web-driven customer focus supports effective e-commerce information management
7	Successful web-driven partner communication supports effective e-commerce information management in virtual organizing
8	Successful web-driven partner learning supports effective e-commerce information management in virtual organizing
9	Effective e-commerce information management support e-commerce oriented product delivery
10	High levels of trust formation require the function of the network broker to be effective.
11	Effective web-driven trust formation is enhanced where the knowledge levels of the co-operative agreement by enterprises in the virtual organization is high.
12	Efficient web-driven virtual network conflict resolution supports the formation of Web-driven trust formation.

5.5 The concluding framework

The narrative storyline used to describe the adjusted paradigm model will now be expanded in order to explain the use of networking capabilities with virtual organizing in a virtual value network of organizations. The storyline of the concluding framework addresses and considers all aspects of the research problem formulated in Chapter Three as:

“To develop a framework of needed networking capabilities and their inter-relationships that enable successful virtual organizing in e-business”.

The concluding description is developed and based on the conceptual framework (Figure 5.6) that indicates the relationships between networking capabilities (Table 5.6) to be restricted by a pattern of conditions (Table 5.5) of the research problem. The concluding description of needed networking capabilities with virtual organizing in e-commerce is the following:

Web-driven trust formation is critical to entrepreneurs in order to ensure effective web-driven supply chain integration; high web-based trust formation furthermore supports web-driven supply chain cooperation as well as successful supply chain shared e-commerce vision implementation.

Web-based trust formation is, under these circumstances, a high priority networking capability to entrepreneurs. Web-based trust formation is typically characterised by networking capabilities such as the ability to act as network broker and knowledge of co-operative agreement. One of the results of the importance of successful web-based trust formation is recognition of trust formation’s contribution to effective e-commerce information management.

Effective e-commerce information management is supported and enhanced through networking capabilities such as effective web-driven partner communication, web-driven customer focus and efficient web-driven partner learning. The consequence of effective e-commerce information management is successful e-commerce oriented product delivery in the global marketplace.

This desired outcome of virtual organizing, namely e-commerce oriented product delivery should in turn enhance web-driven trust formation for further increase in effective virtual organizing in e-commerce.

The theoretical framework identifies and explains relationships between networking capabilities used in virtual organizing in accordance with the problem statement of the study. Networking capabilities when used in virtual organizing activities are vital for the development and enrichment of relationships between partners of the virtual value network. Recurring interaction between networking capabilities can contribute to web-based trust formation. This will be discussed in the next section.

5.6 Implications of the concluding framework

Recognizing the central importance of relationships between partners of a virtual value network the research indicates the complex dynamics associated with the use of networking capabilities in virtual organizing. Accordingly, the most important proposition in the study indicates that web-based trust formation enables e-commerce information management with potential users and partners in electronic markets. E-commerce oriented product delivery is positively related to web-based trust formation in the virtual value network of partners. Defining the phenomenon of the study enables an exploration of the complex relationships between the phenomenon and other networking capabilities.

The established inter-relationships between networking capabilities of the concluding framework hold the potential to enhance the effective use of networking capabilities with virtual organizing for the entrepreneur in the virtual value network. This may be illustrated, e.g., in a situation where steps are needed to enhance effective e-commerce information management. If effective web-driven customer focus is seen as the only needed solution, then the required steps may not be fully effective or could even be a failure. A more comprehensive

approach would require that web-driven partner communication be more efficient or it could be that more efficient web-driven partner learning would secure best results.

Successful implementation of web-based trust formation skills are influenced and enhanced by networking capabilities such as web-driven supply chain cooperation, web-driven value chain integration and supply chain shared e-commerce vision. The use of the above mentioned three networking capabilities enhance web-based trust formation that, in turn, facilitates successful e-commerce information management with resultant improved e-commerce oriented product delivery in virtual organizing. It is important to note that the use of networking capabilities in virtual organizing is cyclical in nature. Even when e-commerce oriented product delivery is successful, improvements in effective virtual organizing will depend on continued trust formation in the e-commerce environment.

Hallberg (2006) highlights the view of Strauss and Corbin (1998) on the value of qualitative research findings of Grounded Theory to be reality that cannot be fully known but can be interpreted in the research study. The Grounded Theory method provides a qualitative research methodology that enabled the findings of literature case of the study to be refined and validated in the empirical cases of the study. The findings of the study should therefore not be considered as the complete 'truth' to be viewed as the 'final' statement on the phenomenon. We therefore consider the result of the findings of the field interviews explained by means of the theoretical framework with resultant statement to be the 'concluding framework' of the research project. The concluding framework is viewed as a conceptual framework with a statement of relationships between categories and sub-categories that is based on developed propositions in order to create more insight into the use of networking capabilities with virtual organizing in the virtual value network of partners.

5.7 Summary

The concluding framework developed in Chapter Five was achieved through theoretical saturation of the categories as well as the incorporation of the new category and two sub-categories in the concluding framework. The conceptual framework with the theoretical description of relationships between identified networking capabilities clarify the use of networking capabilities used with virtual organizing in a virtual network of organizations.

The networking capabilities described in the concluding framework indicate a variety of social and socio-technical skills that enable virtual organizing in a virtual network of partners. The study sensitises researchers to the complex dynamics of networking capabilities used in virtual organizing. An understanding of the interaction between networking capabilities is critical to the success of virtual organizing in the virtual value network of partners.

The next chapter considers the important role that the entrepreneur must play in exploiting networking capabilities in the virtual network of partners. By interpreting the results obtained from an Actor-Network perspective, it is shown how the entrepreneur can leverage the interrelationships that exist between the various network capabilities to enable more effective and efficient virtual organizing in the e-marketplace.

Chapter 6

Defining the role of the entrepreneur in the virtual value chain of partners

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6.1. Introduction

The previous chapter discussed the importance of networking capabilities included in a framework, as processes, to be implemented by the entrepreneur (as well as the other members of the virtual supply network) to enable virtual organizing activities in the virtual supply network of partners. We also established the interrelationships that exist between the various identified networking capabilities and how these interrelationships strengthen virtual coordination activities in the virtual supply network system. The resultant Grounded Theory developed in Chapter Five (the *concluding framework*) explains the interrelationships and importance of networking capabilities that enable virtual organizing activities in a virtual supply network of partners.

What is not clear from the Grounded Theory developed in Chapter Five is the contribution of the network capabilities to the creation and continued maintenance of a virtual value chain of partners (who participate in the e-marketplace) by the entrepreneur. This chapter uses the developed Grounded Theory to focus on the attempts of the entrepreneur to create and maintain a virtual value chain of partners in the e-marketplace. The attempts of the entrepreneur to develop and establish a virtual value chain of partners as well as the users of the product offering in the e-marketplace is viewed through the lens of Actor-Network Theory. We draw upon Actor-Network Theory (ANT) to trace and explain the processes whereby a relatively stable virtual value chain of partners and users become established and is maintained.

The focus of this chapter therefore goes beyond the objectives of the research project as described in Chapter One, where the research problem has been identified as:

“To develop a framework of needed networking capabilities and their interrelationships that enable successful virtual organizing in e-business”.

Having reached this research objective with the development of the Grounded Theory in the preceding chapter, this enlarged focus enables us to examine the dynamics of the establishment and maintenance of the virtual value chain. The developed Grounded Theory does not as such address these dynamic aspects. To put it simply, the developed Grounded Theory does not “tell” the entrepreneur how to utilize the identified networking capabilities to actually build and maintain a successful network of partners, or virtual value chain. This is precisely what the focus of ANT is: to investigate how successful networks of aligned interests between heterogenous elements can be established, or why this sometimes does not happen. ANT therefore provides the ideal vehicle for investigating how the entrepreneur could utilize knowledge and skills with respect to networking capabilities to build a stable and eventually institutionalized network of partners. As such, this deviation from the original focus of the study is deemed useful through the additional contribution that is made by investigating the dynamic aspects of networking capabilities.

First, in section 6.2, the ANT perspective of the Grounded Theory is discussed. The section explains the existence of a virtual value network of partners that is created by the entrepreneur in the e-marketplace of users. The section concludes with a discussion on Inscription and Translation in ANT.

The next section, section 6.3, considers the function and impact of networking capabilities on the formation of a virtual supply network of partners from the perspective of ANT. Since a virtual supply network of partners do not exist in isolation but forms part of a more comprehensive network (virtual value network) that includes users in the e-marketplace the following section examines the existence of an ‘*entrepreneurial process*’ pertaining to the e-marketplace of users.

We then, in section 6.4, consider how a virtual supply network of partners is maintained. We deliberate on how the networking capabilities of the Grounded Theory (developed in Chapter Five) support the entrepreneur in his endeavour to interest and enrol new members into an existing virtual supply network. ANT

ideas (as part of the Due Process Model) provides a useful perspective on the potential functionality of networking capabilities to further advance the efforts of the network broker to introduce new applicants into the virtual supply network.

In section 6.5, the relevance of an entrepreneurial process is explained. We then consider the impact of information technology for the entrepreneur in the e-marketplace of users (external environment) in section 6.6.

The final section draws some conclusions from the findings of this chapter with regard to the role of the entrepreneur in the virtual value network of partners.

6.2. An ANT perspective of the Grounded Theory

This section considers the role and relevance of the developed Grounded Theory on the formation of a virtual value network of partners from the perspective of ANT. The existence of the '*virtual value network*' and its relevance for the entrepreneur of a web-based organization needs to be explained (from the perspective of ANT). The virtual value network includes the virtual supply network of partners, the entrepreneur and the consumers or users of the product or service in the e-marketplace. The virtual supply network consists of only the entrepreneur and his virtual supply network of partners that enables product or service delivery in the e-marketplace of users.

The relevance and importance of a virtual value network of partners for the entrepreneur which participates in the e-marketplace as a web-based organization can be summarized as follows. The web-based organization (as represented by the entrepreneur) participates in the e-marketplace (consisting of users) by means of a virtual supply network of partners in order to realize the economic vision of the entrepreneur. The entrepreneur is referred to as the '*focal actor*' in ANT while the users (in the e-marketplace) are considered to be equal partners in the virtual value chain network. The concept of virtual value network in relation to the virtual supply network is illustrated in Figure 6.1.

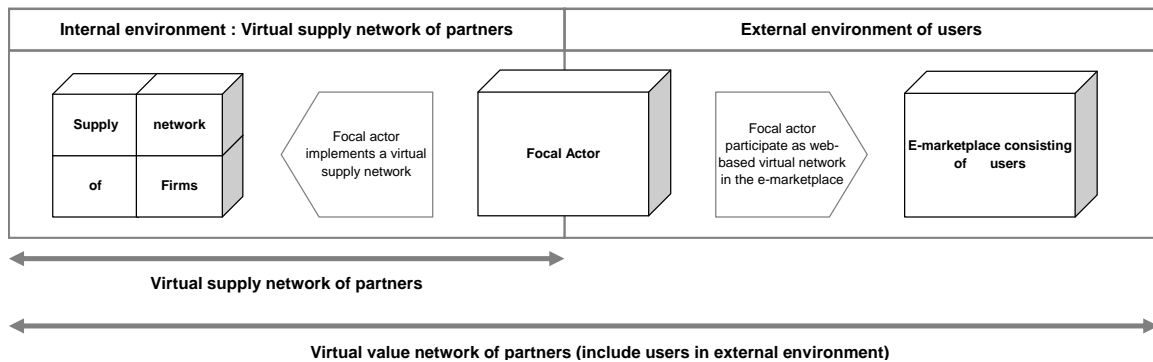


Figure 6.1 The concept of the virtual value network in the e-marketplace

Figure 6.1 indicates the central role of the entrepreneur who participates in the e-marketplace as a web-based organization by means of a virtual supply network of firms. The users in the e-marketplace view the entrepreneur to be a separate entity and independent from the virtual supply network of partners. The entrepreneur performs a central role in the formation of a virtual value network and is held responsible by the users for the success of the virtual supply network of partners in the delivery of products and services in the e-marketplace. Any member of the virtual supply network of partners may potentially perform the role of an intermediary and facilitate the interactions between the different partners included in the virtual value network of partners.

The ANT perspective implicates the entrepreneur as responsible in the establishment of a virtual supply network of partners that enables product and service delivery in the e-marketplace. The entrepreneur, considered to be accountable for the supply actor-network, builds the virtual supply network of partners in order to deliver products and services in the e-marketplace. The virtual value network consists of heterogeneous (technical and human elements) actors that contribute to accomplish the economic vision of the entrepreneur. The entrepreneur is responsible for product and service delivery of the virtual supply network of partners by the users (participating in the e-marketplace) whereas the

partners in the virtual supply network act as delegates who represent and promote the viewpoints of the entrepreneur in the e-marketplace of users.

The entrepreneur realizes his economic vision of the e-commerce oriented product delivery by means of the virtual supply network and needs to consider the merit for the inclusion of each new partner into the actor-network. The partners included in the virtual supply network function as separate entities that participate in the actor-network by means of virtual organizing over distance. Technical (Information Systems) and non-technical (human) actors are considered as equal partners in the virtual supply network. The entrepreneur implements Information Systems in the actor-network to effect changes pertaining to the way partners think and perform virtual organizing activities in order to realize the economic vision (entrepreneur).

ANT identifies two concepts that are of particular relevance for improving our understanding of the way in which networking capabilities affect virtual organizing activities in the virtual value network of partners, namely inscription and translation. The concepts of translation and inscription are discussed in the following sub-section.

6.2.1. Translation and Inscription in ANT

Successful participation in the e-marketplace of users depends on the ability of the focal actor to gain the support of a sufficient number of allies in order to realize the economic vision, namely, e-commerce product delivery. The focal actor needs to gain the support of a sufficient number of candidates (potential allies) to be included in the virtual supply network. The entrepreneur needs to evaluate the interests of each candidate considered for inclusion in the virtual supply network. These interests have to be re-aligned with his own in order to realize the economic vision. Only the candidates that are willing to participate in

virtual organizing activities and strengthen the virtual supply network will be included as partners.

The moments of translation in ANT present a new perspective on how the entrepreneur succeeds in his attempts to enrol and mobilize the candidates into the virtual supply network of partners. The moments of translation create an opportunity to address the problem of action-at-a-distance in the virtual supply network (Kaghan & Bowker, 2001). Actor-network theory indicates four '*moments of translation*' to the achievement of durability in a newly created virtual supply network of alliance. Doolin and Lowe (2002) refer to Law (1992) in describing what should be the aim with the process of translation, namely "*How is it that things get performed (and perform themselves) into relations that are relatively stable and stay in place?*". The achievement of stable relations enables the entrepreneur to realize his economic vision pertaining to e-commerce oriented product delivery by means of the virtual supply network.

A further important concept in ANT relates to inscription. Whereas translation considers aspects of reinterpretation and representation of aligned interests, inscription gives insight as to the patterns of use of Information Technology in order to promote the script of the entrepreneur in the virtual supply network of partners. The entrepreneur inscribes his economic vision for e-commerce product delivery in the technical content of technology systems as the means to affect a change process in the way virtual organizing activities are performed in the virtual supply network of partners.

ANT provides a lens to gain insight and a better understanding as to how the focal actor achieves stability in an actor-network. The focal actor constructs a virtual supply network of partners to be established and accepted as a fact in the e-marketplace of users. ANT puts a lot of emphasis on the entrepreneur and his attempts to align the diverse collection of interests of the various actors included in the virtual supply actor-network. Kaghan and Bowker (2001) explain the importance of negotiations in reaching the status of an established actor-network (black box) as follows:

“Crucially, black-boxes are always the outcome of socio-technical negotiations - it takes continuing work both to create them and to hold them in place. Closure is neither complete nor final”. The virtual supply network, as one member of the value chain, therefore includes allies as well as users (e-marketplace). The more allies and users the focal actor manages to include in the value chain, the more difficult it is to argue against the existing support for the existence of the web-based organization consisting of a virtual supply chain network system.

The interests of each member of the virtual supply network needs to be aligned if the focal actor hopes to build and sustain the actor-network. The entrepreneur uses networking capabilities with virtual organizing activities in order to build and maintain a virtual value network of partners in the e-marketplace of users. The focal-actor is unable to force users to participate in the virtual value network of partners. The entrepreneur may influence the potential user in the e-marketplace to participate in the virtual value network of partners that will be discussed in more detail in section 6.5. The entrepreneur that participates in the e-marketplace by means of a conventional organization (hierarchy) in contrast to the virtual network structured network implements different power structures in order to secure product delivery.

The formation of a virtual supply network of partners will be discussed in the next section.

6.3. The formation of a virtual supply network of partners

The ANT perspective indicates four moments of translation (as indicated in the previous sub-section) to consider how the entrepreneur establishes a virtual supply network of partners. ANT refers to the four moments of translation as: Problematization, Interest building, Enrolment and Mobilization (Callon, 1986). The four identified moments of translation and their contribution in creating a

better understanding of the creation of a virtual supply actor-network (from the ANT perspective) can be summarized as follows:

- The problematization phase is initiated by the focal actor (entrepreneur) who intentionally starts a change process (participation in the e-marketplace) of the status quo of doing business. The focal actor identifies the relevant actors (supply chain partners) and defines their interests in supporting the proposed change (to the e-marketplace). The focal actor then attempts to position the actors in an actor-network, although this only happens after he has successfully established whether each of the actors whom he considers for inclusion in the actor-network has interests that are consistent (not necessarily identical) to his own. The focal actor in addition attempts to establish an Obligatory Passage Point (OPP) in the problematization phase by creating an alliance among relevant participating actors of the actor-network who shares the same objective. The entrepreneur (by means of the OPP) intends to position himself as indispensable to the virtual supply network.
- During the second phase, namely Interest building, the focal actor tries to convince candidates considered for inclusion in the virtual supply network that their best interests are pursued through the OPP. The focal actor may create and introduce incentives for potential firms outside the actor-network to accept the defined problem of the focal actor.
- In the third phase, namely Enrolment, the focal actor assembles an alliance of actors to pursue the objectives he has established. The focal actor defines the roles in the newly created actor-network in order to promote and consolidate the position of the virtual supply network alliance. This is accomplished when the focal actor has introduced various different strategies.
- During the final stage, namely Mobilization, the focal actor attempts to stabilize the actor-network through the creation of durable relations. The focal actor builds on the existing set of enrolled actors in the virtual supply

network in his attempts to ensure the continued support for his underlying ideas and original motivation for creating a virtual-network. The focal actor makes an effort to institutionalize his ideas in the actor-network thereby avoiding its being labelled as controversial by the participating actors.

The attempts of the entrepreneur to create a virtual supply actor-network may not be successful. The '*moments of translation*' explain the various moments in the formation of an actor-network although very different factors might impact on the success of the entrepreneur in his endeavour. The above interpretation of the formation of a virtual supply actor-network from the perspective of the '*moments of translation*' of ANT indicates the central role of the entrepreneur. The next sub-section considers how networking capabilities (Grounded Theory) contribute to the creation of a virtual supply network of partners.

6.3.1. The impact of the Grounded Theory on the formation of a virtual supply network of partners

The Grounded Theory, developed in Chapter Five, provides an understanding of how the identified networking capabilities enable and enhance virtual organizing in a virtual network. In this sub-section this understanding provides the basis for a focus on the task of the entrepreneur to establish a successful virtual supply network of partners.

From the ANT perspective, the creation of the virtual supply network of partners by the entrepreneur is considered to be processes of institutionalization (virtual organizing) rather than structures (virtual organization). Effective socio-technical skills of a personal nature are essential for the focal actor in his attempts to develop a virtual supply network of partners. The focal actor needs to implement and demonstrate strong networking capabilities in the process of creating a virtual actor-network whereas a personal limitation (pertaining to the ability to

implement network capabilities) or the lack thereof will seriously undermine the potential for success.

The use of networking capabilities in the process of creating a virtual supply network implicates the focal actor and his ability to configure and direct the virtual supply actor-network from its initiation. When applying the framework of identified networking capabilities to the translation phases, as identified in ANT, it enables us to comprehend more fully how networking capabilities contribute to the creation of a virtual supply actor-network. The relevance and use of networking capabilities from the perspective of ANT in the process of creating an actor-network by the focal actor is illustrated in Figure 6.2.

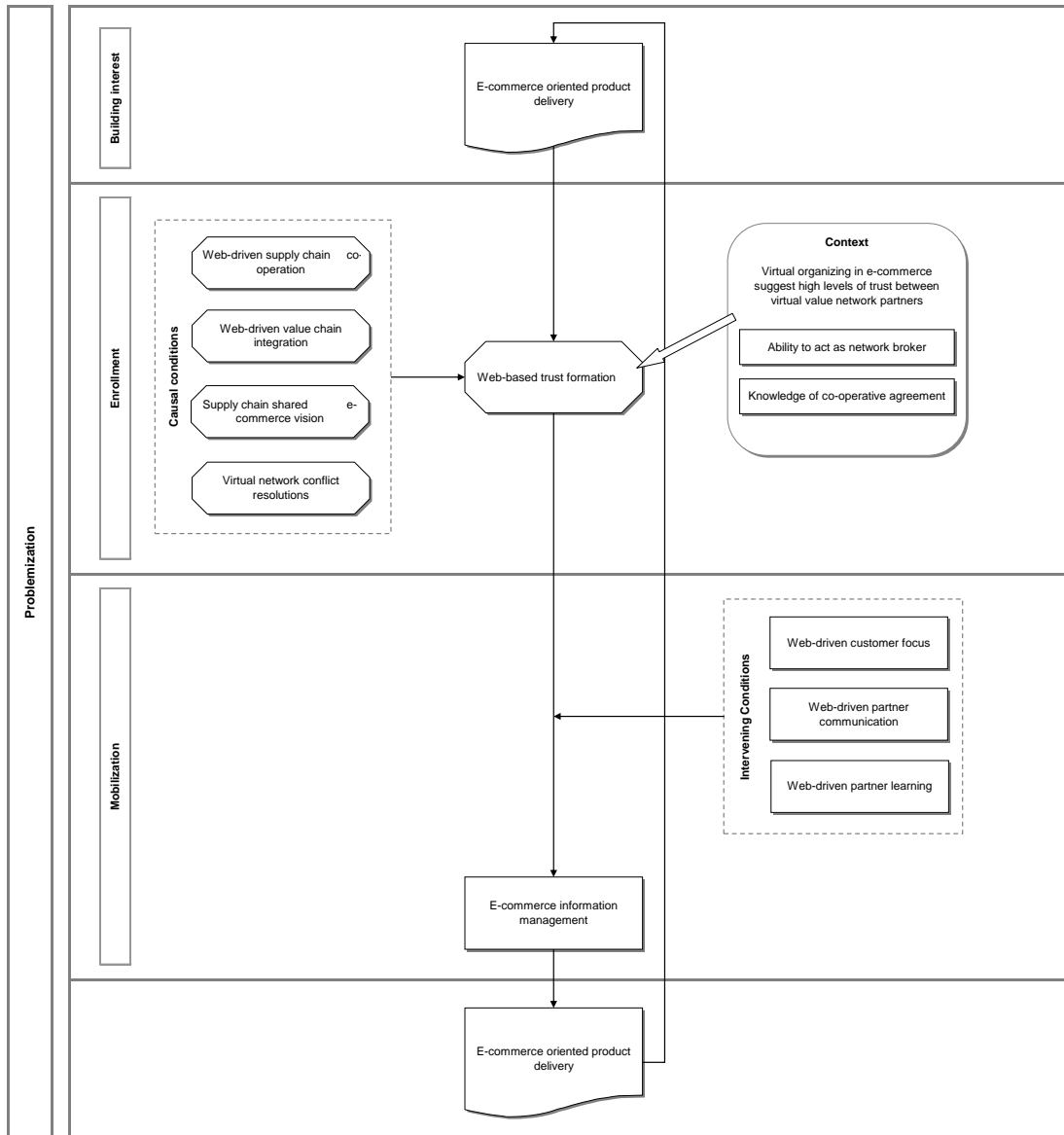


Figure 6.2 Relevance of the Grounded Theory in the translation process

Figure 6.2 indicates the potential contribution of the Grounded Theory (consisting of a framework of identified networking capabilities) in the four moments of translation of ANT when creating a virtual supply actor-network. Relevant networking capabilities to be considered in each of the four moments of translation are identified and categorized (based on their relevance and importance to enable success in each of the four identified moments) in Table 6.1. Table 6.1 indicates the four moments of translation (with accompanying

definitions) and names relevant networking capabilities as primary and supporting networking capabilities to be considered for the successful completion of each of the moments of translation.

Table 6.1 The Grounded Theory applied to the four moments of translation

Moments of translation	Description	Primary networking capabilities exercised	Supporting networking capabilities
Problematization <i>(Becoming indispensable)</i>	Defining problems and suggesting solutions where the focal actor is indispensable in the solution.	E-commerce oriented product delivery Web-based trust formation E-commerce information management	Ability to act as network broker Knowledge of co-operative agreement
Building interest <i>(Locking key allies into place)</i>	Finding ways to (re)formulate the problem/ solutions in such a way that key allies will associate their own interest with the formulation Translate (reinterpret) interests Link to their identity/ vision/ objectives Retain control of the (re) formulation process	E-commerce oriented product delivery	
Enrolment <i>(Expanding support)</i>	Establishing the problem/ solutions as an accepted fact Control/ influence the production of facts. Use allies as spokespersons Inscribe problem/ solutions in organizational memory (scripting)	Web-based trust formation	Web-driven supply chain co-operation Web-driven supply chain integration Supply chain shared e-commerce vision Virtual network conflict resolution
Mobilization <i>(Ensuring compliance)</i>	Ensure compliance by monitoring the network and addressing dissent as and when it arises Use stability in network to enact solutions Restart translation process. Translation is an ongoing process	E-commerce oriented information management	Web-driven partner communication Web-driven partner learning Web-driven customer focus

Table 6.1 indicates the various networking capabilities implicated in the moments of translation. Their contributing to the creation and the development of (hopefully institutionalized) actor-networks can be interpreted as follows:

- **Problematization:** The focal actor needs to demonstrate strong '*E-commerce oriented product delivery*' skills in order to motivate the change process of the status quo of conducting business from the traditional to the e-Marketplace. The focal actor needs to implement '*E-commerce information management*' capabilities in order to identify relevant actors with similar (although not identical) interests as potential candidates to be included in the actor-network. The focal actor needs '*Web-based trust formation*' skills in his attempts to develop an obligatory passage point (OPP) with the intention to create an alliance among the relevant actors with a shared objective. It is only possible for the focal actor to become indispensable to the actor-network when he succeeds in creating a trusting relationship between the participating actors in the actor-network.
- **Building interest:** The focal actor needs to demonstrate '*E-commerce oriented product delivery*' capabilities if he intends to convince participating actors in the network that their best interests are pursued through the obligatory passage point.
- **Enrolment:** The focal actor needs to implement strong '*Web-based trust formation*' skills when creating an alliance of actors in pursuit of the objectives of the focal actor. Where the focal actor succeeds in creating sufficient levels of trust it contributes and enables him to convince potential actors to join the actor-network. The formation of trust in the actor-network is promoted and enhanced where the focal actor demonstrates skills pertaining to '*Web-driven supply chain integration*', '*Web-driven supply chain cooperation*', '*Virtual network conflict resolution*' as well as '*Supply chain shared e-commerce vision*'.
- **Mobilization:** The focal actor with the necessary '*E-commerce oriented information management*' skills should succeed at creating durable

relations in the actor-network. The focal actor that succeeds at demonstrating strong '*E-commerce oriented information management*' skills represents the most effective and efficient means to secure the continued support for the underlying ideas for the existence of the actor-network. The underlying idea or motivation for the creation of the actor-network only becomes institutionalized through effective and efficient '*E-commerce oriented information management*'. The focal actor also needs to implement different skills related to '*Web-driven partner communication*', '*Web-driven partner learning*' and '*Web-driven customer focus*' that promote and enhance '*E-commerce oriented information management*' as the means to institutionalize the actor-network in the e-Marketplace.

Networking capabilities have both enabling and restricting qualities in the formation of virtual supply chain networks. An important consideration for using an ANT perspective was to better understand and explain the possibilities and limitations associated with networking capabilities in the formation of virtual supply chain networks. The ANT perspective emphasizes the importance of socio-technical skills of a personal nature (pertaining to the focal actor) in his attempts to create a virtual supply network. Networking capabilities play an important role, from the perspective of ANT, to enable the '*exchange of properties*' linked to the creation of a virtual supply network although it is doubtful whether a virtual supply network can become '*institutionalized*' without also considering the role of networking capabilities in the external environment of users (in the e-marketplace).

The process of institutionalizing a virtual supply network in the e-marketplace can only be obtained if and where the virtual supply network is flexible enough to establish, address and effectively serve the multiple interests of its other constituent value chain member, namely, the users in the e-marketplace.

Constant changes experienced in a virtual supply network of partners – for example, partners leaving and entering the virtual network impact on the

entrepreneur and his attempts to stabilize the virtual supply network. The most important reasons for changes happening in the actor-network include:

- Forced new (envisioned) e-market product offerings (inscription)
- Changes in the technical content of existing product offerings (translation)
- Existing partners leaving the actor network (interests).

Since the virtual supply network is always in a process of change where actors leave the actor-network and the focal actor in response needs to introduce new actors to the virtual supply network, the continuous success of the web-based organization depends on the entrepreneur's ability to introduce new partners into the virtual supply actor-network. The Due Process Model is helpful in considering the socio-technical negotiations involved where a new partner needs to be included in an existing actor-network. The next section considers the role and importance of socio-technical skills with the introduction of new members into the virtual supply network from the perspective of the Due Process Model. This is considered important if the entrepreneur hopes to continuously delivery his/her product offering successfully in the e-marketplace by means of a virtual supply network of partners.

6.4. The Due Process Model perspective

The Due Process Model provides a framework of how the entrepreneur introduces new partners into an existing virtual supply network. The Due Process Model can also be applied to the implementation of new technology systems in the virtual supply network since ANT does not distinguish between human and non-human actors in a virtual network.

In the Due Process Model any attempt of the focal actor to include a new candidate or when a new candidate presents himself for inclusion needs to be

considered by the actor-network. The actor-network only permits the candidate to be enrolled into the virtual supply network if it is perceived to contribute to strengthening it. The Due Process Model is concerned with and attempts to explain the process by which actors are included and excluded from the virtual supply network. The Due Process Model is illustrated in Figure 6.3.

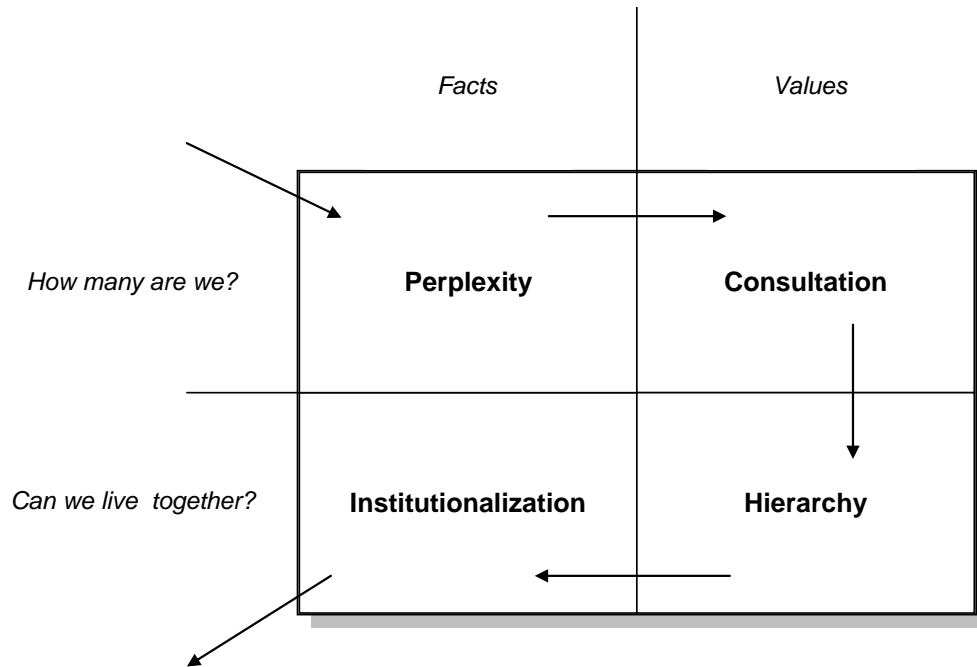


Figure 6.3 The Due Process Model (Source: McMaster *et al.* 1997)

Figure 6.3 indicates the Due Process Model as consisting of four phases namely perplexity, consultation, hierarchy, and institution. While perplexity and consultation considers the issue of ‘*how many are we*’, hierarchy and institution reflects on aspects pertaining to ‘*can we live together*’. The phases are discussed below:

- In the perplexity phase the focal actor put forward a claim for the inclusion of the candidate in the virtual supply network to strengthen it, thereby contributing to the virtual supply network success in the e-marketplace.

This possible inclusion of a new partner in the virtual value chain brings a degree of perplexity to the supply network, and leads to a process where claim and counter-claim need to be tested and contested. The existing actors in the virtual supply network expect the focal actor to consider the impact of the new candidate on the existing network and to explain the potential benefits and disadvantages to be obtained by its inclusion. The candidate that succeeds in demonstrating strong networking capability skills that can benefit and enhance the objectives of the virtual supply network through enhanced virtual organizing activities should gain support, and presents a strong claim for inclusion in the actor-network.

- The entrepreneur leads the next phase, namely, consultation. Concerns about the legitimacy of the candidate are discussed and debated by existing members. A candidate will only be successful in his attempts to be included in an actor-network network when the existing members, after consultation, agree that his potential contribution adds value to the advantage of the virtual supply network in the e-marketplace of users.
- The third phase in the process considers the need to include an additional actor in the actor-network in relation to its relative importance to the virtual supply network. In other words, although actors in the existing actor-network might agree that the new actor should be included, they could still conclude that its importance is relatively low, arguing against its inclusion. If the actors in the virtual supply network reject a candidate in this phase, the actor will be excluded from the virtual supply network system.
- In the final phase of the Due Process Model a candidate that has been accepted is absorbed into the existing network which can then regain its previous status of institutionalization.

In terms of the model, there is always the danger of the entrepreneur driving the process of transformation from phase 1 (Perplexity) directly through to the final

phase, Institutionalization, omitting stages two and three of the model. When the entrepreneur omits and does not apply the next two stages of the Due Process Model, it increases the likelihood of failure and the candidate's non-admittance into the supply network of partners. The Due Process Model shows how all perceived '*enemies*' of the virtual network are excluded although they may, at a later time, appeal for re-admission into the network of partners.

The next sub-section considers the role of networking capabilities from the Due Process Model perspective.

6.4.1. Implications of the Grounded Theory on partner selection and inclusion in a virtual supply network

The networking capabilities of potential new members of the actor-network need to be recognized by existing members as an important criterion when considering whether a candidate should be included or rejected. The focal actor also evaluates the potential set of networking capabilities each candidate may contribute to the virtual supply network as an important consideration for inclusion in the virtual supply network. A virtual supply network consists of individual partners where each partner needs to contribute their resources, competencies, as well as networking capabilities to the actor-network in order for it to succeed in the e-marketplace. The virtual supply network includes actors that take on different roles based on the established virtual value supply chain activities needed to deliver a product or service in the e-marketplace. The different supply chain activities associated with delivery of products and services to the e-marketplace require each member of the actor-network to implement and demonstrate a different set of networking capabilities that enables effective virtual organizing activities.

The focal actor needs to consider whether a candidate for inclusion in the actor-network might threaten his own position in the virtual supply network in time. The

focal actor who takes on the role of network broker will tend to excel at socio-technical skills related to the e-marketplace such as effective '*virtual information management*' as well as '*virtual trust formation*' (entrepreneurial process) whereas actors in the supply network will tend to excel at networking skills concerning the supply network coordination activities (internal process). It is therefore important to note that not every actor with the required tendency or orientation to networking capabilities can take on the role of the focal actor in the virtual value chain formation. In the scenario where a member of the value chain with a typical orientation to technical expertise and know-how, introduces a new technology or feature to the product offering in e-commerce, a different set of networking capabilities might need to be demonstrated by a partner in the virtual supply network. The focal actor should carefully consider each potential new candidate which might threaten his own position in the existing virtual supply chain. Such a candidate might, at a later stage, leave the existing supply network and start a competing supply network based on its own ability to perform the network broker activities, thereby putting the existing supply chain network of partners at risk.

Members of an existing actor-network will tend to resist the inclusion of a new applicant into the virtual supply network who demonstrates strong networking capabilities and technical know-how related to a specific function in the supply chain, thereby protecting their own interests.

Once the needed constituency of existing actors in the virtual network has been considered in the perplexity and consultation phases of the Due Process Model, aspects pertaining to the question of whether the actors can live together needs to be considered (hierarchy and institution phases). Networking capabilities should contribute to the success of virtual organizing activities in the virtual supply network. The Due Process Model highlights the importance of effectively linking the resources, personal and firm-specific capabilities with the existing set of networking capabilities of the different actors participating in the supply network. To illustrate the point, the network broker tends to excel at networking capabilities such as virtual information management ('*E-commerce oriented*

information management') whereas actors participating in the value supply chain typically demonstrate a more technical orientation that is linked to networking capabilities such as '*Web-driven value chain integration*'. The actor that successfully participates in the virtual supply network either as a network broker and/or supply chain member (i.e., succeeds with the implementation of the needed set of networking capabilities) will not only improve their own competitive advantage in the specific supply chain (central actor) but will also help create and improve the competitive advantage of the virtual supply chain in the e-marketplace.

The view of the virtual network as consisting of an assembly of actors that contribute vastly different sets of networking capabilities needed to function effectively in the supply network highlights the fact that the agent cannot simply be replaced at will in a virtual network without seriously impacting on its potential to succeed in the e-marketplace. ANT demonstrates, by means of the Due Process Model, how the entrepreneur motivates the need to introduce a new member (based on his potential to contribute a set of network capabilities as an important consideration for the success of the virtual supply chain) into the actor-network. The Grounded Theory (consisting of a framework of identified networking capabilities) supports the entrepreneur in determining the suitability of a candidate considered for inclusion in the actor-network.

Since a virtual supply network does not exist in isolation but forms part of a virtual value network of partners that includes the users in the e-marketplace, we need to consider the use of networking capabilities by the entrepreneur in the creation of the virtual value network in the e-marketplace of users. The next section considers the use and implications of the Grounded Theory for the entrepreneur in the external environment of users.

6.5. The formation of the virtual value network of partners

The entrepreneur that performs the role of network broker is responsible for the web-based organization and its virtual supply network of partners to fulfil its business objectives in the global e-marketplace. The entrepreneur needs to implement networking capabilities that impact on the success of web-based organizations in the in e-marketplace. The identified networking capabilities not only contribute to the creation of a virtual supply network (as explained through the lens of ANT), it also enables virtual organizing activities between actors in the actor-network (consisting of a virtual supply network of partners) as well as effective participation in the e-marketplace (external environment).

Much can be learned from the concluding framework on which networking capabilities the focal actor needs to excel at in order to effectively compete in the e-marketplace. The concluding framework (Chapter Five) explains how networking capabilities enable virtual organizing between participating firms in a virtual supply network as follows:

Successful implementation of virtual organizing suggests effective ‘Web-driven trust formation’ as the core enabling networking capability.

Effective ‘web-driven supply chain co-operation’, ‘Web-driven value chain integration’, ‘Supply chain shared e-commerce vision’ and ‘Virtual network conflict resolution’ acts not only as causal conditions but highlights and supports efficient ‘Web-based trust formation’.

The above-mentioned networking capabilities as well as the ‘Ability to act as network broker’ and ‘Knowledge of cooperative agreement’ necessitate successful formation of ‘Web-based trust formation’ in the virtual network of value chain partners. The outcome of ‘Web-based trust formation’ is effective ‘E-commerce information management’ pertaining to not only the virtual network of partners but includes e-commerce consumers. Effective ‘E-commerce information management’ is conditioned by networking capabilities such as

effective ‘Web-driven customer focus’, ‘Web-driven partner learning’ and ‘Web-driven partner communication. These intervening networking capabilities enhance and contribute to more efficient and effective ‘E-commerce information management’.

‘E-commerce information management’ enables more successful ‘E-commerce oriented product delivery’ in e-commerce. The attainment of effective and efficient ‘E-commerce oriented product delivery’ in e-commerce contributes to the creation of ‘Web-based trust formation’.

The concluding framework storyline indicates the existence of networking capabilities that directly impact on the ability of the entrepreneur to conduct virtual organizing activities in e-commerce. The entrepreneur is responsible to the customers in the e-commerce environment to deliver on the promises of the web-based organization and he needs to excel at specific networking capabilities that enables virtual organizing activities to be performed which impacts on the external environment of users, namely:

- *‘Web-based trust formation’*
- *‘E-commerce information management’*
- *‘E-commerce oriented product delivery’*

As indicated in Chapter Five it is important to note that two additional sub-networking capabilities should be included under *‘Web-based trust formation’*, namely:

- *‘Ability to act as network capability’*
- *‘Knowledge of cooperative agreement’*

The above-mentioned three networking capabilities which impact on the external environment of the web-based organization are illustrated in Figure 6.4.

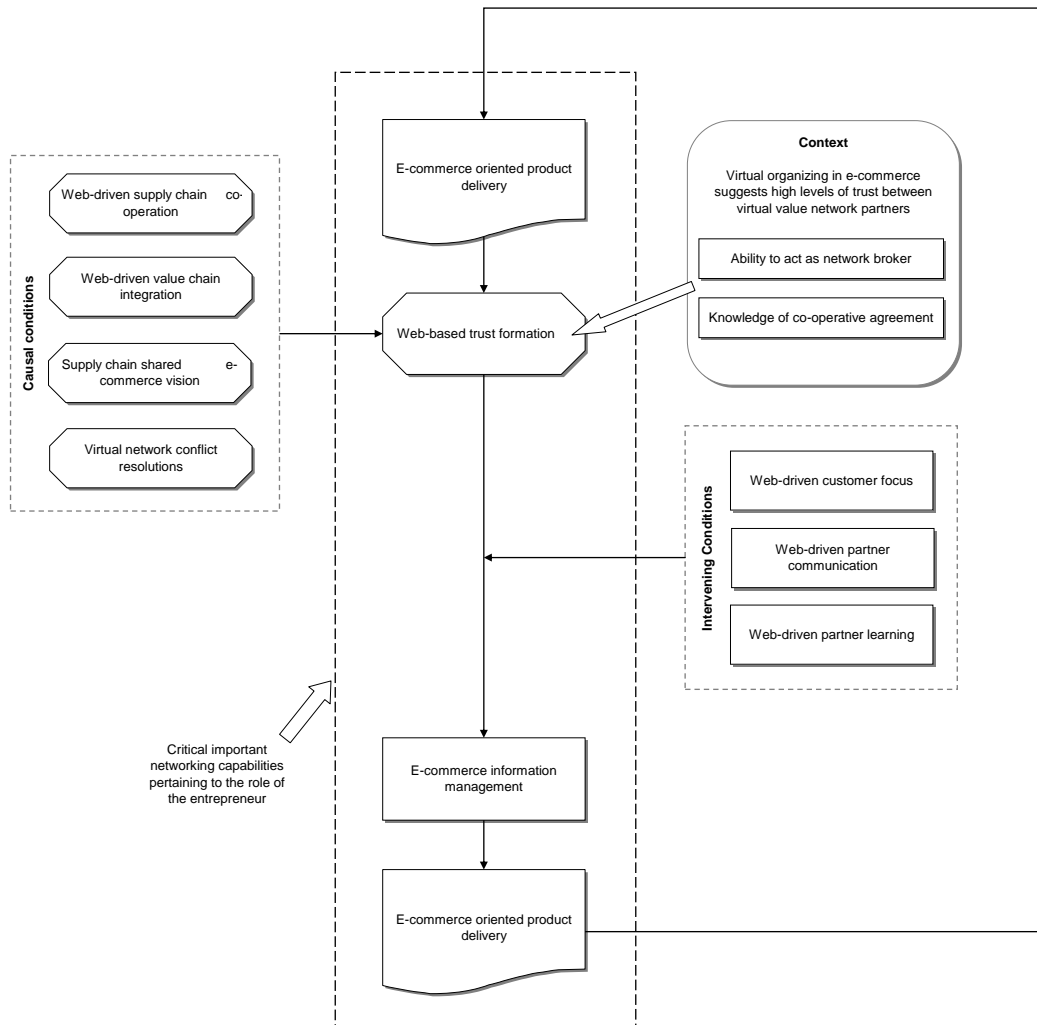


Figure 6.4 The concluding framework

Figure 6.4 highlights three networking capabilities, namely ‘*Web-based trust formation*’, ‘*E-commerce information management*’ and ‘*E-commerce product delivery*’ as the critically important components in a process that enables the e-commerce related virtual organizing activities of the entrepreneur. Since the entrepreneur is accountable for the web-based organization this process is referred to as the ‘*entrepreneurial process*’.

The entrepreneurial process includes three networking capabilities namely ‘*Web-based trust formation*’, ‘*E-commerce information management*’ and ‘*E-commerce oriented product delivery*’ pertaining to the external environment (e-marketplace)

as well as the internal environment (network of partners). The entrepreneurial process highlights the importance of entrepreneurial vision for the network broker that wish to succeed in the e-marketplace. Important considerations pertaining to the three mentioned networking capabilities include the following:

- In a rapidly changing environment the entrepreneurial vision should lead the integration of networking capabilities between participating firms. The collective activities of the virtual network should therefore be led by the entrepreneurial vision as reflected in '*E-commerce oriented product delivery*'. In other words, '*E-commerce oriented product delivery*' represents the basic idea or vision of the web-based firm by the entrepreneur. It is also important to note that the business development process as a networking capability is mostly presented in '*E-commerce oriented product delivery*'. '*E-commerce oriented product delivery*' furthermore represents the final networking capability. The network broker or entrepreneur needs to revise the entrepreneurial vision at intervals and the entrepreneurial vision should co-evolve with the unfolding business venture. Most importantly, the entrepreneurial vision must be co-developed to match the resource base of participants of the value supply chain. Web-based entrepreneurial firms tend to act on their vision and the limits they have in terms of resources and capabilities determine the value chain configuration and the need for virtual organizing.
- The entrepreneur tends to determine the feasibility of the business model when he promotes and "sells" it to potential network partners, the capital market and to the potential customer. This process is linked to the networking capability of "*Web-based trust formation*". When the vision of the entrepreneur with regard to the product offering is accurate in identifying the actual customer e-commerce need, it will positively affect "*Web-based trust formation*".
- The two critically important networking capabilities namely '*Web-based trust formation*' and '*E-commerce oriented product delivery*' are linked to a

third network capability named “*E-commerce information management*”. It is critically important to entrepreneurs who implement virtual organizing to develop or establish dialogue with the customers. E-commerce represents a high-velocity market and “*E-commerce information management*” suggests a dynamic capability that relies on real-time information, cross-functional relationships as well as intensive communication between the web-based firm interacting with the external market and members of the value chain involved in business development processes.

The above discussion indicates the use of the three identified networking capabilities included in the ‘*entrepreneurial process*’ by the entrepreneur with virtual organizing activities in the e-marketplace of users. The three networking capabilities included in the ‘*entrepreneurial process*’ enable and support virtual organizing activities of the entrepreneur in pursuit of new opportunities in the e-marketplace that impacts on the economic vision of the entrepreneur.

The network broker needs to excel at all three networking capabilities included in the ‘*entrepreneurial process*’ in order for the virtual supply network to become institutionalized. The entrepreneur needs to create and build relationships with the partners included in the virtual value network as well as with the potential users in the e-marketplace in order to realize the economic vision. The entrepreneur use the networking capabilities of the entrepreneurial process with virtual organizing that create a competitive advantage in the e-marketplace of users through the creation of a virtual value network in order to realize the vision of the entrepreneur. Such a competitive advantage can only be obtained when trusting partners (a term that include users) in the value chain network create and share information which enables the network broker to deliver e-commerce products and services that addresses the interests of all participating members of the value chain network.

The entrepreneur with the ability to use the networking capabilities (included in the ‘*entrepreneurial process*’) with virtual organizing activities in the e-marketplace cannot be replaced by another potential or existing partner of the

virtual supply network at random. The entrepreneur needs to consider whether candidates considered for inclusion in the virtual supply network have adequate capacity to use networking capabilities that enables virtual organizing activities as to prevent the early demise of the virtual supply network. The entrepreneur who acts as network broker needs to excel at all the identified network capabilities that differentiate him from the partners in the virtual supply actor-network.

The implementation and development of networking capabilities by partners in the virtual supply network are dynamic in nature and happens continuously. The entrepreneur and partners in the virtual supply network need to continuously improve on their ability to use networking capabilities with virtual organizing brought about through ongoing changes that is happening in the e-marketplace. Members of a virtual supply network that demonstrate the capacity to use networking capabilities with virtual organizing enhance their value in the e-marketplace to be introduced and to successfully participate in other virtual supply networks.

The use of networking capabilities with virtual organizing influences the action of the partners in the virtual value network. Information Systems guide the actions of partners of the virtual value network over distance. Partners participate in various different networks where technology systems become a distinctive characteristic of a virtual actor-network. The impact of information technology on the virtual value network where partners share technology systems will be considered in the next section.

6.6. The role of information technology in the virtual value network

The concept of '*Inscription*' introduced in the discussion of ANT provides a way to understand the role of Information Systems for the entrepreneur that enables complex virtual organizing actions of humans and non-humans in a virtual value network of partners.

The vision of the entrepreneur to be achieved by means of virtual organizing activities (across distance) enables the creation of a virtual value network of partners in the e-marketplace. The entrepreneur envisions the e-commerce product offering of the virtual supply network to be advanced in the e-marketplace of users. Inscription gives a new perspective of the role of Information Technology for the entrepreneur and his attempts to align the heterogeneous interests of participating actors to be embedded in Information Systems (non-human actors). The aligned interests of the partners are embedded in Information Technologies that promotes the script of the entrepreneur and stabilize the virtual value network. Once the development of the virtual value network reaches the stage where its existence becomes '*seemingly irreversible*', it is considered to be a fact in the e-marketplace. The position of the virtual value network continuously grows stronger and more relevant in the e-marketplace as more users from different virtual value networks enrol.

The entrepreneur implements Information Systems as a partner and preferred spokesperson of the virtual value network of partners in the e-marketplace. The claim of the entrepreneur pertaining to the e-commerce oriented product offering necessitates the introduction of virtual organizing activities in the e-marketplace in order to realize the vision. Information Systems then acts as the delegate who stands in and speaks on behalf of the entrepreneur in the actor-network as the preferred spokesperson. The entrepreneur implements Information Systems as an active delegate and spokesperson to promote the claim of aligned interests (script) in the virtual value network of partners. The script of the entrepreneur Inscribed in Information Systems advances the interests of the entrepreneur.

The implementation of technology systems facilitates the creation of relationships with potential users in the e-marketplace, to be included in the virtual value network. The entrepreneur develops a social agenda, namely web-based trust formation, to be promoted with the implementation of information technology. The entrepreneur inscribes the aligned interests of the partners in Information Systems that facilitates web-based trust formation in the e-marketplace of users.

The impact of information technology that promotes the agenda of the entrepreneur, to be advanced with the use of networking capabilities with virtual organizing activities, is illustrated in Figure 6.5.

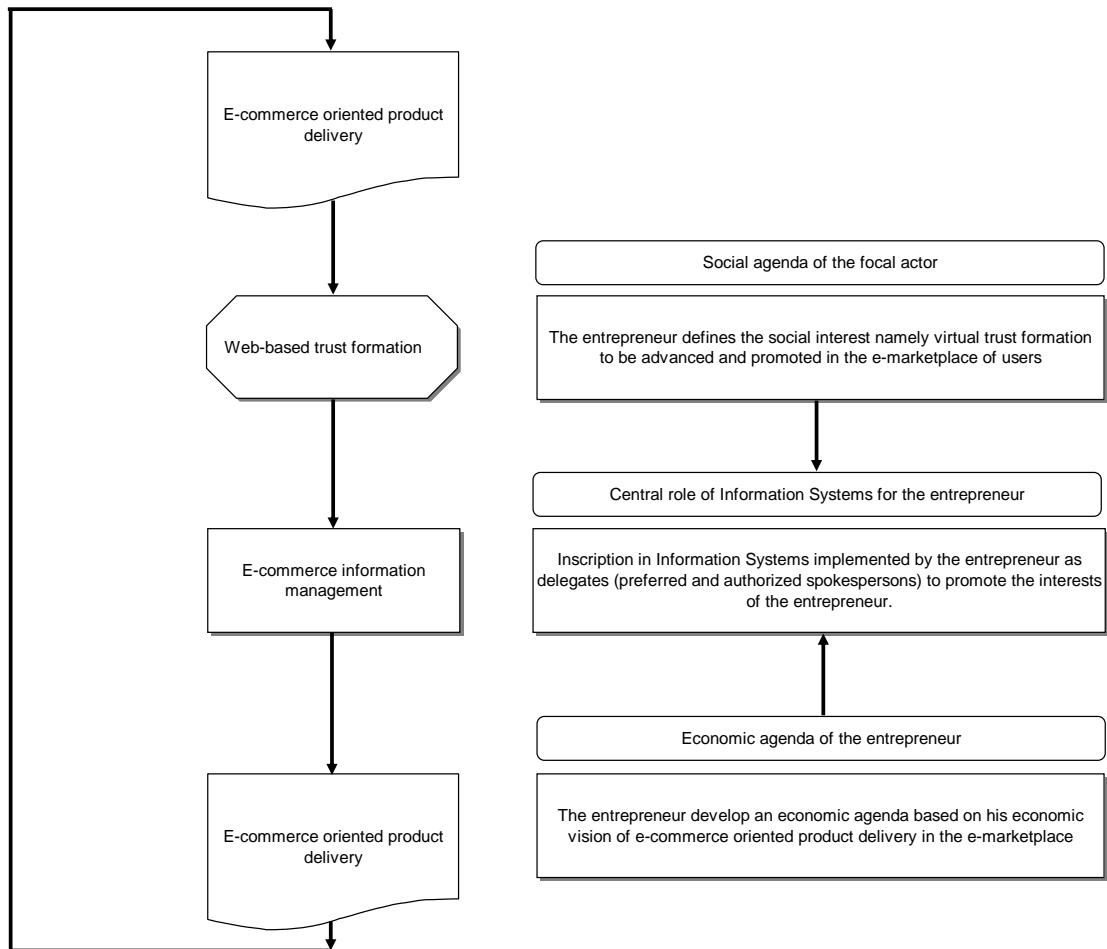


Figure 6.5 The role of information technology with virtual organizing

Figure 6.5 illustrates the central role of information technology to advance the social and economic agenda of the entrepreneur Inscribed in Information Systems. The entrepreneur implements Information Systems (partner) as a program of action to advance the script (aligned interests) and economic agenda for e-commerce product delivery in the e-marketplace. The script of the entrepreneur, Inscribed in Information Systems, necessitates the implementation of virtual organizing activities in the e-marketplace of users. The entrepreneur attempts to promote his interests in the structuring of data and information as well as in the software analysis capabilities allowed for as part of the Information Systems.

Figure 6.5 indicates the social outcome namely virtual trust formation in the e-marketplace of users to be realized with the implementation of Information Systems in the e-marketplace of users. Information Systems becomes the medium that enables the desired social change namely trust formation to be advanced through virtual organizing activities in the e-marketplace of users (vision of the entrepreneur). The focal actor advances his social agenda (web-based trust formation) by means of Information Systems (technical artefacts) in order to realize his aligned interests pertaining to the economic vision by means of the virtual value network.

The entrepreneurial process of networking capabilities used with virtual organizing advances the social agenda of the entrepreneur namely '*virtual trust formation*' Inscribed in the hardware and software implemented in the virtual value network of partners. The entrepreneur inscribes social meaning, namely, '*virtual trust formation*' in materials that include manuals, texts and technical objects in order to advance his aligned interests of the economic vision. ANT provides a valuable analytical lens through which to observe how Information Technology affects social change, namely, virtual trust formation, as an important requirement for the formation of the virtual value network of partners.

The entrepreneur attends to the constant flow of new advances in technology systems that impact on the implementation and use of networking capabilities with virtual organizing in the e-marketplace. New advances in technology systems also impacts on the vision of the entrepreneur for e-commerce oriented product delivery in the e-marketplace. Any changes in the economic vision of the entrepreneur necessitate the interests of partners to be realigned with the entrepreneur inscribed in technology systems. The entrepreneur therefore needs to continuously develop the virtual value network in response to constant changes in the e-marketplace that threatens to destabilize the actor-network.

The final section of the chapter draws some conclusions as to the role of the entrepreneur in the virtual value network.

6.7. Defining the role of the entrepreneur in the virtual value network

The final section considers the role of the entrepreneur in the virtual value network of partners. The Grounded Theory perspective, as interpreted here through the lens of Actor-Network Theory, provides insight as to the role of the entrepreneur in the creation of a virtual value network and the implementation of networking capabilities (included in the entrepreneurial process) that enable virtual organizing activities in the e-marketplace.

The economic vision of the entrepreneur defines the opportunity to be addressed with the e-commerce product delivery in the e-marketplace. Information Systems act to strengthen the original claim (e-commerce oriented product delivery) of the entrepreneur and disseminate it throughout the virtual value network of partners. Successful translation results in the creation of a virtual value network that realizes the economic agenda for e-commerce oriented product delivery of the entrepreneur in the e-marketplace of users. The networking capabilities, included in the entrepreneurial process, enable virtual organizing activities in pursuit of the

economic vision of the entrepreneur to be realized by means of the virtual value network of partners.

The entrepreneur advances his economic vision by means of Information Technology that enables virtual organizing activities and limits the scope of action that is available to partners of the virtual value network. The use of networking capabilities with virtual organizing activities by the users in the e-marketplace indicates a willingness of partners to participate in particular ways of thinking and acting that promotes the vision of the entrepreneur. Figure 6.6 indicates the use of the networking capabilities (in the entrepreneurial process) by the entrepreneur that enables and supports participation of users in the virtual value network.

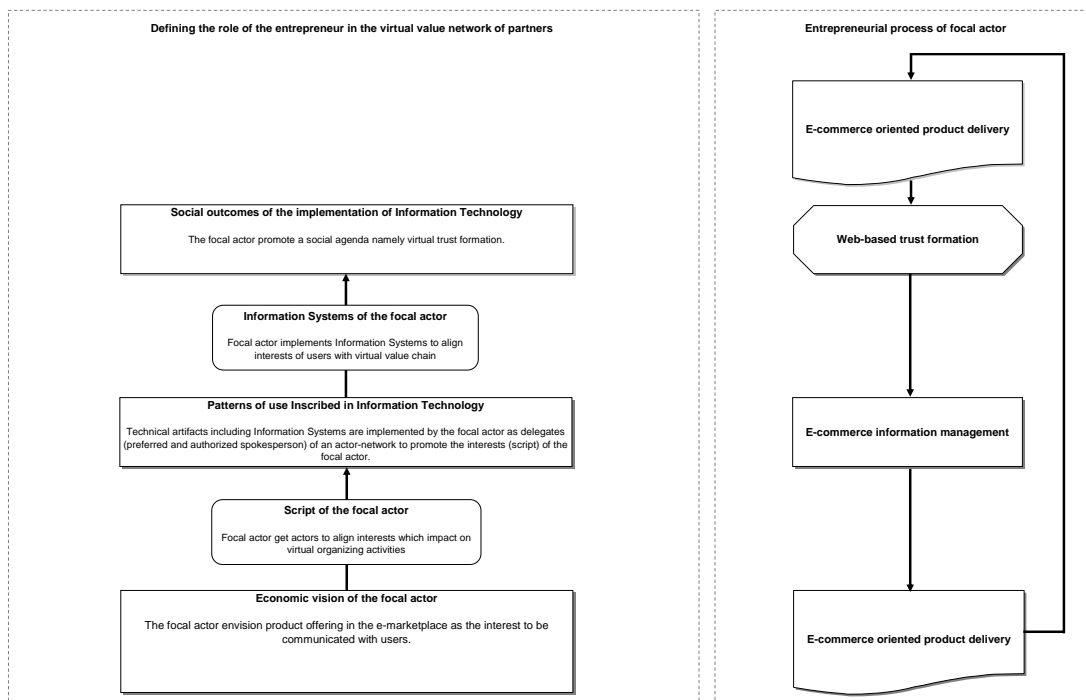


Figure 6.6 The role of the entrepreneur in the virtual value network of partners

The pattern of use inscribed in Information Systems promotes virtual trust formation amongst potential users and indicates the scope of networking capabilities to be used with virtual organizing activities. The entrepreneur uses '*E-commerce information management*' skills when he inscribes his vision in

Information Systems that advance virtual trust formation amongst potential users. The entrepreneur implements Information Systems as an actor (partner) with the power to advance his claim for the creation of a virtual value network and influences decision making and trust formation amongst potential new users through the alignment of interests inscribed in Information Systems.

The processing, transmission, collection and storage of information as elements of an Information System necessitate the use of '*e-commerce information management skills*' by the entrepreneur to positively influence the decision-making process of the potential user.

The entrepreneur affects virtual trust formation when he uses e-commerce information management skills with the implementation of Information Systems. Information Systems promote his claim to be advanced through the virtual value network. The entrepreneur realizes the desired social (virtual trust formation) and technical (e-commerce product delivery) outcomes by means of Information Systems as the means to advance his economic vision. Information Systems, acting as preferred "spokesperson" of the entrepreneur, facilitate web-based trust formation amongst potential users to influence participation in the virtual value network of partners. Trust formation amongst users as the social outcome of inscription in Information Systems enables the entrepreneur to successfully assemble a virtual value network. Information Systems further enable the entrepreneur to achieve stability and control over the virtual value network of partners.

The inter-relationship that exists between the networking capabilities (of the entrepreneurial process) creates insight as to how the entrepreneur performs activities in the e-marketplace in order to create relations (the virtual value network) that are relatively stable and stay in place.

Information Systems hold the key to both enable and to inhibit participation of potential users in the virtual value network. Information Systems need to communicate trustworthy, timely and useful information that translates the interests of the partners to be promoted by means of the e-commerce product

offering. The claim of the entrepreneur inscribed in Information Systems must be backed with information and facts that indicate integrity and insight to convince the potential user that his best interests are promoted and protected with the e-commerce product offering. Participation of the user in the virtual value network as a partner enables the entrepreneur to gain valuable information. The information obtained from the user enables the entrepreneur to strengthen the virtual value network, to be used as a platform, to validate and improve on the claim of the entrepreneur pertaining to the economic vision for e-commerce product delivery in the e-marketplace.

The ability of the entrepreneur to create and establish a virtual value network to be considered an accepted fact in the e-marketplace demonstrates abilities of a personal nature (the ability to successfully implement networking capabilities) and validates the role of the entrepreneur as the focal-actor in the virtual value network of partners. The network capabilities included in the entrepreneurial process, to be used with virtual organizing activities by the entrepreneur in the e-marketplace, implicate expertise. The entrepreneur with the ability to implement the required networking capabilities when conducting virtual organizing activities in the external environment of users has the power to create, build and establish the virtual value network to be considered as an ongoing concern in the e-marketplace of users.

Chapter 7

Evaluation of the research

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7.1. Introduction

Chapter Seven concludes the study with an evaluation of the research. The research aimed to explore and describe the use of networking capabilities with virtual organizing activities in virtual value networks of partners. The study applied the Grounded Theory methodology in gathering and analyzing data from a literature case study as well as empirical cases. The research resulted in the development of a conceptual framework with storyline on the use of network capabilities with virtual organizing in the e-marketplace. The substantive theory of the study contributes to a better understanding of the use of networking capabilities through constructs of the framework. The study reveals a complex process with the introduction of networking capabilities with virtual organizing. The findings of the research have implications for web-based businesses that implement virtual organizing in a virtual value network of partners.

The next section provides an overview of the research study. Section 7.3 evaluates the research against the proposed set of principles of Klein and Myers (1999) for conducting and evaluating interpretive field studies in Information Systems. Section 7.4 considers the theoretical contribution of the research according to questions on related issues identified by Whetten (1989). Section 7.5 describes an empirical organizational case study that enables categories and structured processes of the theoretical framework to be tested. The final section consists of concluding remarks about the research with suggestions on the way forward with this particular research theme.

7.2 Overview of the research study

7.2.1 Review of the research problem

The success of web-based businesses in electronic markets depends on the successful implementation of virtual organizing in the virtual value network of partners. Members of the virtual value network need to adopt, demonstrate and develop socio-technical skills used with virtual organizing in the electronic marketplace. The research study was concerned with the research problem, namely: *“To develop a framework of needed networking capabilities and their inter-relationships that enable successful virtual organizing in e-business”*. The research study delivered a framework of networking capabilities with inter-relationships that support co-operation between members of the virtual value network. The use of networking capabilities with virtual organizing strengthens collaboration between partners in the virtual value network.

Twelve networking capabilities were defined and described in the framework and a case study is introduced in this chapter to evaluate the theory. When used with virtual organizing, these networking capabilities may lead to improved business relationships in the virtual value network. It was also shown how the effective and efficient use of the networking capabilities with virtual organizing impacts the competitiveness of web-based businesses in electronic markets.

The use of networking capabilities with virtual organizing support the entrepreneur to foster close relationships in the virtual value network in response to changes in electronic markets. Choosing a strategy in the use of networking capabilities with virtual organizing with the aim to strengthen new or existing inter-relationships in the virtual value network is challenging. The inter-relationships established in the research study between networking capabilities used with virtual organizing may support the entrepreneur in his attempts to strengthen inter-relationships in the virtual value network.

7.2.2 How research objectives address the problem and contribute to the literature

The research study delivered a framework of networking capabilities with inter-relationships that is not only informative but functional in its use with virtual organizing in the virtual value network. The framework of the research study provides practical theory that may improve virtual organizing in web-based business. The inter-relationships explained by means of a framework established how specific networking capabilities may strengthen each other when used with virtual organizing. The research objective of the study has been formulated as follows: *“To develop better understanding of the capacity of networking capabilities to not only enable, but to enhance, effective and efficient virtual organizing in a virtual network of organizations”*. The framework (theory) of the research study provides a strategic view of the use of networking capabilities with virtual organizing in electronic markets.

7.2.3 The research design and how it was implemented

Chapter One provided the background for the research study. The electronic marketplace is an integral part of the new economy with an emphasis on networking skills used with virtual organizing in virtual value networks. The research study concentrated on the social-technical skills of entrepreneurs and managers that participate in virtual value networks in electronic markets.

Chapter Two reviewed the extant literature and focused on elements and complexities related to virtual organizing activities of virtual value networks in electronic commerce. The chapter introduced and highlighted the need for a systemic approach in the use of networking capabilities with virtual organizing.

Chapter Three defined the research objective as the development of a framework (theory) of networking capabilities (and their inter-relationships). The qualitative research approach of Grounded Theory method (Strauss and Corbin) was adopted and explained in the chapter. The GTM provided a systemic set of procedures to develop an inductively derived theory [that is grounded in data] on the phenomenon of the study.

Chapter Four delivered the preliminary framework by using a literature case as source of data. The literature case, a set of 21 articles, was not a subset of the literature reviewed in Chapter Two, but consisted of articles that were specifically selected since they provided a holistic approach to the topic of virtual organizing in virtual value networks. An article that focused on only one aspect of virtual organizing was not considered for inclusion in the literature case. Many of the articles were therefore not from mainstream journals. But as a replacement for interviews, they provided a rich source of data.

Chapter Five introduced six field studies as the means to extend and explore categories of the preliminary framework to arrive at the concluding framework of GTM. The field studies delivered rich data that resulted in one new category, as well as two sub-categories included in the concluding framework of the research study.

Chapter Six used Actor-Network Theory to interpret the concluding framework developed in Chapter Five. It was shown how networking capabilities used with virtual organizing can be used to establish and maintain a virtual value network. As such it highlighted the dynamic possibilities of the networking capabilities, something that was not captured in the concluding framework. The entrepreneurial process was defined that also provided explanatory value to consider the role of information technology in virtual organizing. The chapter concluded with an assessment of the role of the entrepreneur with the entrepreneurial process of virtual organizing.

7.2.4 Research findings and contribution

The framework (theory) of the research study extends current understanding of the concept of networking capabilities by defining and relating the identified capabilities. The framework provides practical theory on the use of networking capabilities in virtual organizing to establish or strengthen existing inter-relationships in the virtual value network and as such may be useful for web-based businesses in the development of a strategic approach to the use of networking capabilities with virtual organizing in the virtual value network of partners.

7.2.5 Implications of the work for theory and practice

The theory of the research study, together with its interpretation in Chapter 6, explains when, how and why various networking capabilities are used with virtual organizing. The study presented a theory of networking capabilities used with virtual organizing as a means to advance the development of co-operative inter-relationships between partners of the virtual value network. The theory provides new insight that impact on web-based businesses' approach to virtual organizing in the virtual value network. The framework may guide the entrepreneur when considering approaches to virtual organizing in the virtual value network of partners. The interpretation of the theory in Chapter Six furthermore provides guidelines for the dynamic application of the networking capabilities to establish and maintain a virtual value chain.

Web-based businesses have much to learn from the theory of the research study and its use in virtual organizing. The theory explains inter-relationships between identified networking capabilities that provide a strategic approach to virtual organizing with its emphasis on socio-technical skills of a personal nature. Partners in the virtual value network need to share their understanding and

strategic use of networking capabilities with virtual organizing in electronic markets. The theory of the research study will only benefit entrepreneurs where partners share a common understanding and strategic approach in the use of networking capabilities with virtual organizing in electronic markets.

7.2.6 Limitations of the work

The research study was limited to web-based businesses in Gauteng, South Africa that participate in electronic markets. Web-based businesses from various different industrial sectors compete [with unique product and service offerings] in electronic markets. More research needs to be undertaken to test the relevance and value of the framework (theory) with web-based businesses that compete in various different industrial sectors in the global electronic marketplace.

The network structure adopted by competing virtual value networks in electronic commerce may impact on the use of identified networking capabilities [of the conceptual framework] with virtual organizing. The research study assumed that the established inter-relationships between networking capabilities of the conceptual framework are equal in importance regardless of the network structure adopted by web-based business in electronic markets. There is scope for future research that examines the importance of the identified networking capabilities and the established inter-relationships of the framework in the context of the particular network structure adopted by virtual value networks in electronic markets.

7.3 A set of principles for conducting and evaluating interpretive field studies in Information Systems

Klein and Myers (1999) proposed a set of principles for conducting and evaluating interpretive studies in the field of Information Systems. The principles are summarized in Table 7.1.

Table 7.1 Set of principles for evaluation of interpretive field research of Klein and Myers (1999) (Adapted from Rowlands, 2005)

	Principles	Methodological emphasis
1	Principle of hermeneutic tradition	Explain the nature of socially constructed human meanings as well as the interdependent meaning of the parts and the whole that they form
2	Principle of contextualisation	Explain the socio-historical context so that the intended audience can understand the emergence of the current situation.
3	Interaction between researcher and subjects	Explain the mutual interactions of the researchers with the participants. It stresses that social facts are produced as parts of the social interaction of the researchers with the participants
4	Abstraction and generalisation	Explain how insights are derived through the use of a particular theoretical lens acting as a sensitising device to view the world in a certain way.
5	Dialogical reasoning	Explain possible contradictions between the theoretical preconceptions and the data gathered, allowing for a subsequent cycle of revision.
6	Multiple interpretations	Explain possible variations in participant's interpretations. This principle asks researchers to present possible variations in interpretations among the participants.
7	Principle of suspicion	Explain possible bias in narratives collected from the participants and in finding alternative explanations to the problem under investigation.

Klein and Myers (1999) describe the principles for evaluating interpretive field research to be applicable to research that is hermeneutic in nature. Orlikowski

(1993) considers Grounded Theory methodology to be '*interpretive*' (Orlikowski, 1993) since it implements qualitative and unstructured data (Strauss and Corbin, 1990) while theory-building strategy in Grounded Theory is inductive in nature (Strauss and Corbin, 1990). Hughes and Jones (2003) deem the Grounded Theory methodology implementation to be '*fitting*' with the interpretive nature of Information Systems research.

Hermeneutics create meaning where the researcher needs to apply himself to the interpretation '*with a sense of responsibility to deepen understanding*' (Moules, 2002). The Grounded Theory similarly involves itself with understanding the meaning of text (Rennie, 2000).

The Grounded Theory methodology consists of a hierarchical set of coding processes of which Sarker *et al.* (2001) say that '*coding is considered to be an interpretive act of the researchers who are sensitized to certain theoretical concepts*'. Coding is used by researchers to construct categories and the relations of categories in a conceptual framework that represent their understandings of the meaning in data.

The process of interpretation requires entering into the hermeneutic circle (Moules, 2002). She describes the hermeneutic circle as representing a '*metaphorical way of conceptualizing understanding and the process of interpretation to which I participate, belong and am situated*'. The hermeneutic circle involves a generative recursion between the data as a whole and the data in part. Reflection on the part of the researcher even prior to transcribing the text of an interview reflects on an immersion in the data as a whole and the data in part. The dynamic ever evolving nature of the interaction through re-reading, reflection and writing of the case study data enables the researcher to focus, recognize and isolate new understandings in the process of interpretation. The process of the '*hermeneutic circle*' implies that emergent codes need to be refined over the term of the research project (Lee, 1991). In the process of developing categories and inter-relationships from case study data the

researcher is thus making explicit the implicit in a process of interpretation on a continuous basis.

The seven principles of Klein and Myers (1999) provide the Grounded Theory researcher with the opportunity to assess the quality of the interpretive research. This is discussed next by considering each of the seven principles in turn.

7.3.1 The principle of the hermeneutic circle

The principle of the hermeneutic circle is considered the most fundamental principle, integral to the other principles. The research study aimed to understand the parts of the phenomenon where the inter-relationships between identified networking capabilities influenced our understanding of the parts. Improved understanding of the phenomenon of the study (the whole) in turn changed our perception of the networking capabilities and identified inter-relationships.

The hermeneutic circle is the generative recursion between the whole and the part (Moules, 2002). Being in the circle necessitates a dynamic and evolving interaction with case study data as a whole and in part. The text (literature case study) and transcripts (empirical cases) needed to be interpreted in terms of their parts as well as the context of the study. In the research the principle of the hermeneutic circle illustrates how human understanding is achieved by iterating between considering the shared meaning of the parts (categories and sub-categories) and the set of inter-related processes considered to be the whole that they represent in the theoretical framework of the study.

The use of the Grounded Theory methodology in developing the preliminary framework from the literature case data entailed shifting between the whole and parts. Each article of the literature case data was interpreted for meaning from the whole text that consists of sentences whilst each individual sentence influenced how the entire text was interpreted. The principle also applied to each

text that was interpreted in context of the article, where the context needs to be re-interpreted in relation to the text.

The principle of hermeneutics also applied to the empirical case data used to develop the concluding framework of the study. The researcher entered the hermeneutic circle when data was collected, transcribed and analyzed from interviews. The researcher got a sense of the whole (text) in the process of conducting the interview. Personal involvement in the process of conducting the interview enabled the researcher to create deeper understanding of the resultant text (transcripts). The process of coding the empirical case data in the text also influenced the researcher in understanding sentences of the text. Understanding of the sentences of the text influenced how the text was understood.

The process of coding the literature case data as well as the empirical case data enabled the preliminary and concluding frameworks to be developed. The process of coding involved moving between the paradigm models of the study in order to arrive at the developed concluding framework. The case study data were analyzed for themes and ideas which enabled further concepts to be developed that further explained the use of networking capabilities in virtual organizing.

7.3.2 The principle of contextualization

The principle of contextualization highlights the importance of critical reflection on the social and historical background of the phenomenon studied in the research. The principle of contextualization was relevant to the literature review, literature case and the empirical case of the research study. The introductory chapter explained the context of the study. A broad and thorough review of relevant literature preceded the process of defining the research problem with research objective and research questions. The literature review provided further insight into the importance of networking capabilities with virtual organizing in the virtual value network of partners for web-based business.

The preliminary framework presented in Chapter 4 was developed by using as data a selected number of journal and other papers (literature case data). This means that the preliminary framework is firmly placed within the context of the literature.

The empirical cases broadened the context of the study from the theoretical to the practical in the development of the concluding framework of the research. The case studies provided background information on the interviewees and their business contexts.

7.3.3 The principle of interaction between the researchers and the subjects

The researcher needs to be aware of the interpretation of data as expressions and meanings communicated by the interviewees. Interpretations are the outcome of the social interaction between the researcher and interviewee during the interview.

The researcher was closely involved with the interviewees to promote interpretation and analysis of the research topic. Interaction during interviews involved the interviewees as interpreters and analysts with the researcher. Although exploratory questions were used during interviews the interviewees talked unreservedly on any related issues that impact on the phenomenon. The researcher probed the interviewees for more insight and explanations that might improve understanding of opinions expressed during the interviews. This led the interviewees to rethink and provide their own interpretations while the researcher was made aware of own processes of interpretation and analysis.

7.3.4 The principle of abstraction and generalization

The Grounded theory methodology, with its emphasis on the hierarchical coding processes and theoretical sampling, enabled first a preliminary and then a concluding framework with storyline to be extracted from case study data. These frameworks with their storylines are viewed to be abstractions derived from case study data.

The concluding framework presents, in the terminology of Strauss and Corbin, a substantive theory – pertaining to a specific phenomenon. As shown by Lehmann (1999) such a substantive theory can be enhanced and extended to ‘formal theories’ and eventually to a ‘Grand Theory’. In this research no attempt was made to enhance (thus to generalize) the derived, substantive theory to a formal theory. We do apply, however, the substantive theory to a practical situation in Section 7.4, and thereby show the applicability of the theory outside the context within which it was developed.

7.3.5 The principle of dialogical reasoning

The principle of dialogical reasoning requires the researcher to be sensitive about possible contradictions between his own preconceptions guiding the research design, and the actual findings of the research, with subsequent cycles of revision of the preconceptions.

In this research the researcher’s preconceptions were framed by an in-depth study of relevant literature. This led to the research design and the development of the preliminary framework which was developed by applying the Grounded Theory method to a selection of literature – the literature case. However much cycles of revisions were performed during the various coding processes of the Grounded Theory method, the preliminary framework nevertheless in a very real sense embodied these preconceptions.

Subsequently, however, as discussed in detail in Chapter 5, the preliminary framework was enhanced and refined through the use of three empirical case studies to produce the concluding framework of the research. The coding processes discussed in Chapter 5 constitute the ‘cycles of revision of the preconceptions’ and we can conclude, therefore, that the principle of dialogical reasoning was followed.

7.3.6 The principle of multiple interpretations

The principle of multiple interpretations requires sensitivity on the part of the researcher to possible differences in interpretations among participants who provide multiple narratives or stories about essentially the same issue.

In this research two types of ‘participants’ come into play. First, in the literature case data used to develop the preliminary framework (Chapter 4) various authors ‘tell their stories’ about issues pertaining to virtual organizing. Second, in the empirical case studies used to refine the preliminary framework into the concluding framework, interviewees contributed their stories.

In both cases the researcher had to deal with different and conflicting interpretations. Thus, for example, interviewees in the empirical case studies would express opinions that would be influenced by the particular business in which they operate, and these would often be at variance with each other.

The coding processes of the Grounded Theory Method forced the researcher in both cases to re-consider, re-evaluate and re-align initial interpretations. In other words, the Grounded Theory Method does not allow the researcher to gloss over multiple and perhaps conflicting interpretations.

7.3.7 The principle of suspicion

The literature case data, containing a number of journal articles and technical reports, obviously reflect the biases and ‘distortions’ of the various authors. Similarly, the empirical case data reflected the views of entrepreneurs of web-based businesses. The researcher therefore needed to guard against misinterpretations when reflecting on these empirical data.

The processes of coding of the Grounded Theory method again helped to create meaning from the case study data rather than just to report on meaning that was communicated in the articles and interviews.

The study also considered the role of networking capabilities in the formation of a virtual supply network from the perspective of Actor-Network theory. The ‘moments of Translation’ of ANT indicated the central role of the entrepreneur in the formation of a virtual supply actor-network. The complexities that have to be dealt with when new members need to be introduced into the virtual supply network of partners were analyzed using the Due Process Model. The ANT perspective of the theory led to the identification of the ‘entrepreneurial process’ that includes three networking capabilities of the concluding framework to be used by the entrepreneur with virtual organizing in electronic markets of users. The ANT interpretation of the Grounded Theory developed in the study (Chapter Six) also emphasized the role of information technology in support of the efforts of the entrepreneur to align the heterogeneous interests of participating actors.

Current business thinking acknowledges that successful participation of web-based businesses in electronic markets depends on co-operative inter-relationships between partners of the virtual value network. The contribution of the research is that it underlines the important role of the entrepreneur and that it shows how specific networking capabilities could be exploited to establish a successful virtual organization. In particular, the central role of web-based trust formation in virtual organizing that was brought out in the Grounded Theory,

provides a basis for understanding the interplay of the different networking capabilities.

The set of principles of Klein and Myers (1999) enabled the quality of the interpretive research to be evaluated. The discussion in Sections 7.2.1 – 7.2.7 indicates how each of the seven principles was implicitly adopted in the research process.

The next sub-section evaluates the contribution of the study according to a number of questions posed by Whetten (1989).

7.4 Evaluating the contribution of the research

In this section the research findings of the study are assessed for their contribution to knowledge. Whetten (1989) provides a number of questions that can be used in such an assessment. The assessment is based on six key questions that lead the evaluator in the evaluation process. The six questions are: What's new? So what? Why so? Well done? Done well? Why now?

The research is evaluated next under separate sub-headings for each of the six key questions.

7.4.1 What is new? Does the study make a significant value-added contribution to current thinking?

The concluding framework developed in the research study represents a first, substantive theory to provide insight into the importance of socio-technical skills referred to as networking capabilities that are used in virtual organizing activities. The concluding framework or Grounded Theory developed in this study attempts to provide a holistic understanding of the contribution of networking capabilities to virtual organizing in virtual networks of partners. The theoretical framework with

storyline adds value and new insight for entrepreneurs of web-based business that implement virtual organizing in the virtual value network of partners.

7.4.2 So what? Will the theory likely change the practice of Information System research?

The concluding framework with storyline established the central importance of trust formation in virtual value networks of partners. Information Systems enable the entrepreneur to communicate trustworthy, timely and useful information that promotes the interests of all the partners. Actor-Network Theory provided a new perspective of the Grounded Theory of the research study and indicated the use of Information Systems that enable and support participation of potential users in the virtual value network of partners.

The research findings showed how socio-technical skills of a personal nature are relevant for all members of the virtual value network that participate in virtual organizing activities and showed the potential and important contribution of Information Systems to enhance virtual trust formation amongst partners. Thus, when the entrepreneur implements Information Systems to communicate information and facts, this has the potential to convince the potential user that his best interests are promoted and protected with the e-commerce product offering.

Participation of the user in the virtual value network as a partner enables the entrepreneur to gain valuable information. The information obtained from the user enables the entrepreneur to strengthen the virtual value network, to be used as a platform, by validating and improving on his/her claim for e-commerce product delivery in the e-marketplace. Networking capabilities provide the stimulus for virtual organizing activities that challenge the general assumptions on technical skills rather than socio-technical skills as the main driver or motivation of virtual organizing activities.

The research with its focus on meaning, action and processes in a socio-technical context contributes to how we approach and conceptualize the use of information systems in organizational and social contexts. The study shows the value of interpretive research methods in Information Systems research as a means to improve our understanding of the meaning, use and implementation of information systems in organizational and social contexts. In this sense, the research contributes to the practice of IS research, while it must modestly submit that it is not likely to change the practice of IS research.

7.4.3 Why so? Are the underlying logic and supporting evidence compelling?

The development of the preliminary framework with storyline was based on the Grounded Theory methodology where emerging concepts and categories were developed from the literature case study data. The resulting preliminary framework needed further refinement that was based on empirical case data. A concluding framework was developed that explains the effective use of networking capabilities in virtual organizing.

The preliminary and concluding frameworks were both developed using the processes of the Grounded Theory method. As such, they are the result of the inherent logic of the GTM, which guided the researcher every step of the way. The supporting evidence was clear all along – the literature case data in the development of the preliminary framework, and the empirical case data in the development of the concluding framework.

Furthermore, in Section 7.4, the real-life application potential of the result of the research was put to the test. By further validating the concluding framework this provides additional evidence in support of the research.

The research study therefore used multiple data sources to derive its final result in a convincing, logical manner from the supporting evidence (the data). Further

supporting evidence in the form of a validation through an additional case study (in Section 7.4) is also provided.

7.4.4 Done well and well done? Is the thesis well written, does the thesis reflect seasoned thinking?

Chapter One provides an introduction to the central ideas and concepts of the research study. The chapter provides the motivation for the study as well as the objectives of the research project. An outline, presented as a roadmap, indicates the theme of each chapter of the thesis. The thesis consists of seven chapters where each chapter has a clearly defined objective and contributes, explains and provide information towards achieving the overall objective.

Each chapter of the thesis provides a short introduction to the chapter with relevant information on what it contains. Each chapter then concludes with a summary in order to highlight the important issues that have been addressed as well as to enable the reader to reflect on what has been achieved in the chapter. The summary concludes with a short description of what the following chapter aims to address in the context of the research project.

The literature review presented in Chapter Two provides an analysis of the literature on the use of networking capabilities with virtual organizing in the virtual value network of partners. The formal understanding of elements that impact on virtual organizing activities, as well as the use of networking capabilities, is given in Chapter Two. Chapter Three considers the development of research questions as well as the Grounded Theory methodology that was used in the study. The chapter motivates the use of the Grounded Theory methodology. Processes and procedures of the Grounded Theory methodology are explained in Chapter Three. Chapters Four and Five applied the Grounded Theory Method in generating the preliminary and concluding frameworks.

Chapter Six of the study provides an interpretation of the Grounded Theory through the lens of Actor-Network Theory. This contributes to a deeper understanding of the Grounded Theory. It also provides a deeper insight into the use of networking capabilities with virtual organizing in a virtual value network of partners. This interpretation of the research findings allowed deeper conclusions to be drawn regarding virtual organizing in the virtual value network of partners.

Chapter Seven provides an evaluation of the research. The evaluation focuses on the quality of the research and on the contribution to knowledge that has been made through the research. In addition, the concluding framework developed in the study is validated by discussing its application to a particular case study.

It can therefore be concluded that the thesis is presented in a coherent manner. With regards to whether it reflects 'seasoned thinking' it can only be stated that none of the work or result reported here was arrived at without considerable effort and reflection.

7.4.5 Why now? Is the topic of contemporary interest to scholars in this area?

The editorial note to a special issue of the Journal of information Systems (14, 2004) highlights dramatic changes in electronic markets with recent advances in technology and the effect it has on electronic business activities. This resonates with the research study which demonstrated the relevance and use of networking capabilities with virtual organizing activities in the virtual value network of partners.

The concluding framework with storyline of the study has implications for web-based businesses, in particular for electronic business elements such as network formation, and virtual organizing activities. It also calls for a rethink of the role of the entrepreneur and information technology in the virtual value network of partners. The research therefore brings new understanding of issues pertaining

to virtual organizing and information system implementation in the virtual value network of the entrepreneur when performing electronic business activities in electronic markets.

The identification of the socio-technical oriented networking capabilities used with virtual organizing and the exploration of the complexities of inter-relationships influenced by social processes of the virtual value network are likely to appeal to scholars in the field of Information Systems.

Sub-section 7.3.5 concludes the evaluation of the contribution of the research study using the questions posed by Whetten (1989). The evaluation focused on the contribution of the interpretive research study to the development of theory in Information Systems. The evaluation of the research confirms that the research study has potential significance for future Information System research.

Finally, before concluding this chapter in Section 7.6, the results of the research (in the form of the concluding framework presented in Chapter 5) are applied to a particular case study. This serves as a validation of the research results by showing the applicability and usefulness of the concluding framework.

7.5 Dell's case study

The objective of the research was:

“To develop better understanding of the capacity of networking capabilities to not only enable, but to enhance, effective and efficient virtual organizing in a virtual network of organizations”.

A theory or framework was therefore developed which could be helpful to entrepreneurs and managers of web-based organizations and improve their understanding of the capacity of networking capabilities to enable effective and efficient virtual organizing. This represents an important step in the process of finding an accommodating and effective solution to situations where

entrepreneurs and managers need to improve on their virtual organizing capabilities in order to succeed in e-commerce.

The concluding framework (as depicted in Figure 5.7) has significant explanatory potential. This potential will be illustrated through the application of the framework to a case study of an entrepreneur participating as a web-based organization in the e-marketplace. The explanatory power of the framework will, in the following discussion, be illustrated by relating and applying the theory or framework (with propositions and conditions associated with successful use of network capabilities in virtual organizing) to the implementation of networking capabilities as implicated in the particular case study.

The case study that was selected is entitled: “*The power of virtual integration: an interview with Dell Computers’ Michael Dell*” (Magretta, J. 1998. Harvard Business Review, March/April 1998: pp. 72). The case study can be summarized as follows:

Michael Dell discusses how his company is using technology and information to blur the traditional boundaries in the value chain among suppliers, manufacturers and end users. Other topics include how Dell has pioneered a new business model within the computer industry; outsourcing, establishing collaborations; how the direct model through e-commerce benefits his suppliers; the company’s fast-cycle segmentation; how Dell forecasts demand; coordination with customers; how Dell stays close to its customers; the role of research and development in the company; and leadership in a virtually integrated organization. Dell Computers is one of the most successful virtual organizations in e-commerce, having created a twelve billion dollar company in only thirteen years.

Michael Dell never mentioned or discussed elements of trust during the interview. One may only speculate on the reason for this. It may well be that Michael Dell preferred to concentrate on issues that relate to physical and quality flows in networked business supply relations (Kinder, 2003) rather than to concentrate on

social flows and capabilities during the interview. The value and importance of trusting relations in the virtual value network for the Dell Computer Corporation are confirmed in the words a former chief operation officer in suggesting that *“trust, not profits, is the single greatest challenge facing the business world today”* (Jarvenpaa & Tanriverdi, 2002).

The complete case study is attached as Annexure 4. The concluding theory (developed in Chapter Five) will now be used to provide structured comment, in the context of the case study, on the potential use and applicability of the concluding framework for the entrepreneur of a web-based organization which implements virtual organizing in a virtual supply network. The framework, as a key element of the theory, is shown, for quick reference purposes, in Figure 7.1 below.

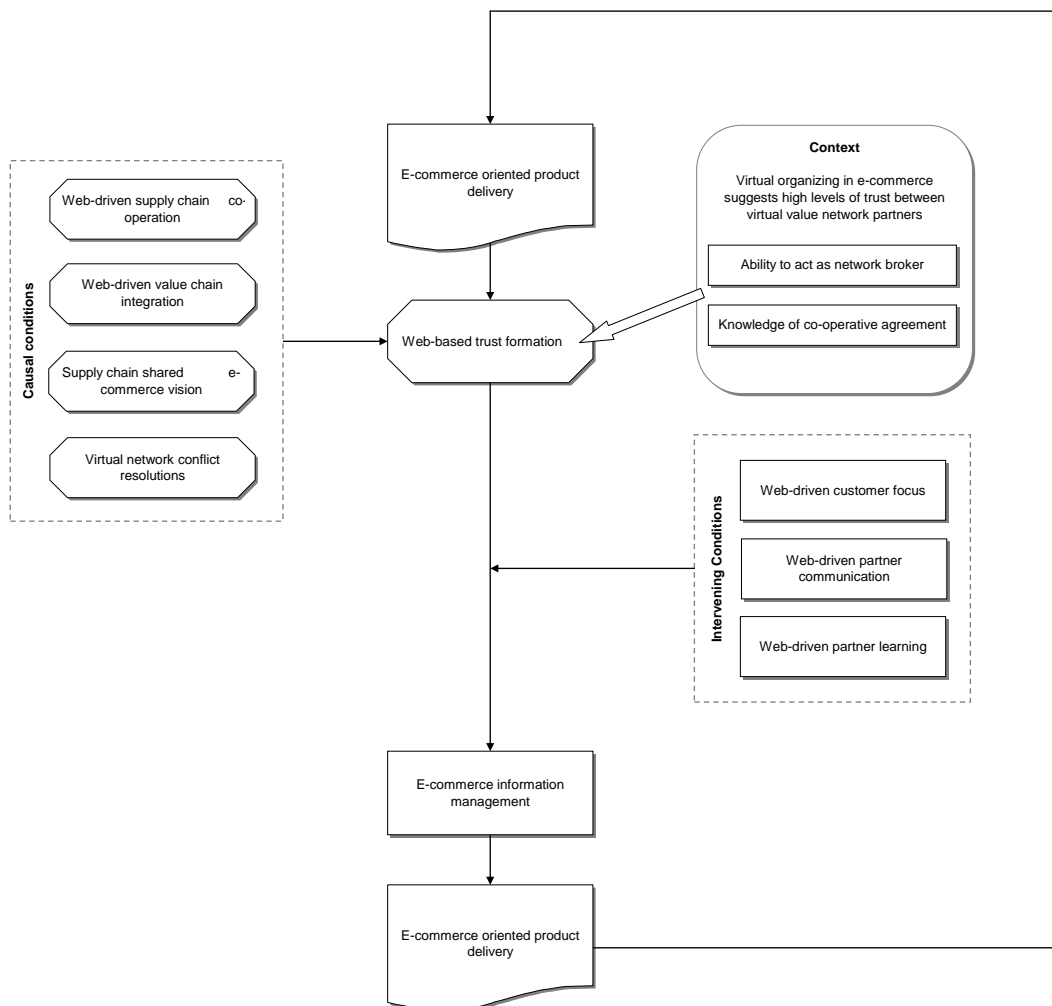


Figure 7.1 The concluding framework

The framework must be viewed in combination with the propositions describing the relationships between the framework elements (Table 5.6) and the pattern of conditions under which networking capabilities enable virtual organizing (Table 5.7).

The case study highlights the role of networking capabilities which enable effective virtual organizing activities in the virtual value chain network (in the e-marketplace). In terms of the framework (Figure 7.1) specific networking capabilities support effective web-based trust formation:

- a. One such capability is effective '*Web-driven value chain integration*'. Virtual integration of specialized firms making up the supply chain seems to be a critical aspect of virtual organizing. Dell states: "*Virtual integration harnesses the economic benefits of two very different business models. It offers the advantages of a tightly coordinated supply chain that have traditionally come through vertical integration*". Other statements such as: "*...Dell's insight into how to combine them is highly innovative: technology is enabling coordination across company boundaries to achieve new levels of efficiency and productivity*" support the role of web-driven value chain integration. The advancement of '*Web-driven value chain integration*' skills supports interactions amongst partners that strengthen '*Web-based trust formation*' in the virtual value network (Jarvenpaa & Tanriverdi, 2002).
- b. Another important networking capability that supports Web-base trust formation of the conceptual framework is '*Web-driven supply chain co-operation*'. The different firms of Dell Computers cooperate on important business activities such as product design and share design teams across borders. The case study highlights this expectation as follows: "*They assign their engineers to our design team, and we start to treat them as if they were part of the company*". Furthermore, the firms of Dell Computers

- co-operate to satisfy customer segments securing customer satisfaction. The advancement of '*Web-driven supply chain co-operation*' promotes collaborative relationships in support of '*Web-based trust formation*' in the virtual supply network of partners (Jarvenpaa & Tanriverdi, 2002).
- c. The third networking capability that supports web-based trust formation of the conceptual framework is '*Supply chain shared e-commerce vision*'. Dell Computers consists of specialized companies in order to secure effectiveness and efficiency. The following statement highlights the importance of this networking capability: "*As the industry grew, more specialized companies developed to produce specific components. That opened up the opportunity to create a business that was far more focused and efficient*"; and: "*We focus on how we can coordinate our activities to create the most value for the customer*" indicating the role of '*Supply chain shared e-commerce vision*' as a networking capability. The development of '*Supply chain shared e-commerce vision*' guides inter-relationships between partners thereby extending '*Web-based trust formation*' in the virtual value network (Jarvenpaa & Tanriverdi, 2002).
- d. The specific proposition (Table 5.6) that relate to the above discussed networking capabilities are:
- Web-driven supply chain co-operation ensures effective virtual organizing and supports efficient web-based trust formation.
 - Successful web-driven value chain integration ensures effective virtual organizing and supports efficient web-based trust formation.
 - The importance of supply chain shared e-commerce vision is that it ensures effective virtual organizing and supports efficient web-based trust formation.

The propositions supporting the framework (Table 5.10) indicate that successful '*E-commerce oriented product delivery*' supports more effective '*Web-based trust formation*' and that '*Web-driven supply chain cooperation*' contributes to effective

virtual organizing when it supports the establishment of efficient '*Web-based trust formation*' in the virtual value chain network. Dell's remark: "*The supplier effectively becomes our partner. They assign their engineers to our design team...*" indicates how effective '*Web-driven supply chain co-operation*' can build trust in virtual value networks turning participating firms and consumers into partners. Dell Computers' level of integration, of the virtual supply network into the virtual value network, is of such a nature that partners represent the web-based organization with its users as and when required to do so. This suggests a highly effective integrated virtual supply network of partners which share an e-commerce vision. Dell states: "*The vast majority (customers) think that person works for us, which is just great. That's part of virtual integration*".

The research has shown that since '*Web-based trust formation*' is of critical importance to support virtual organizing, '*E-commerce information management*' will be important to entrepreneurs and management. Figure 7.2 points out that '*E-commerce information management*' is supported by various networking capabilities that intervene on its effectiveness and efficiency. Effective '*E-commerce information management*' enables '*E-commerce oriented product delivery*' which in turn supports '*Web-based trust formation*' in the virtual network of partners.

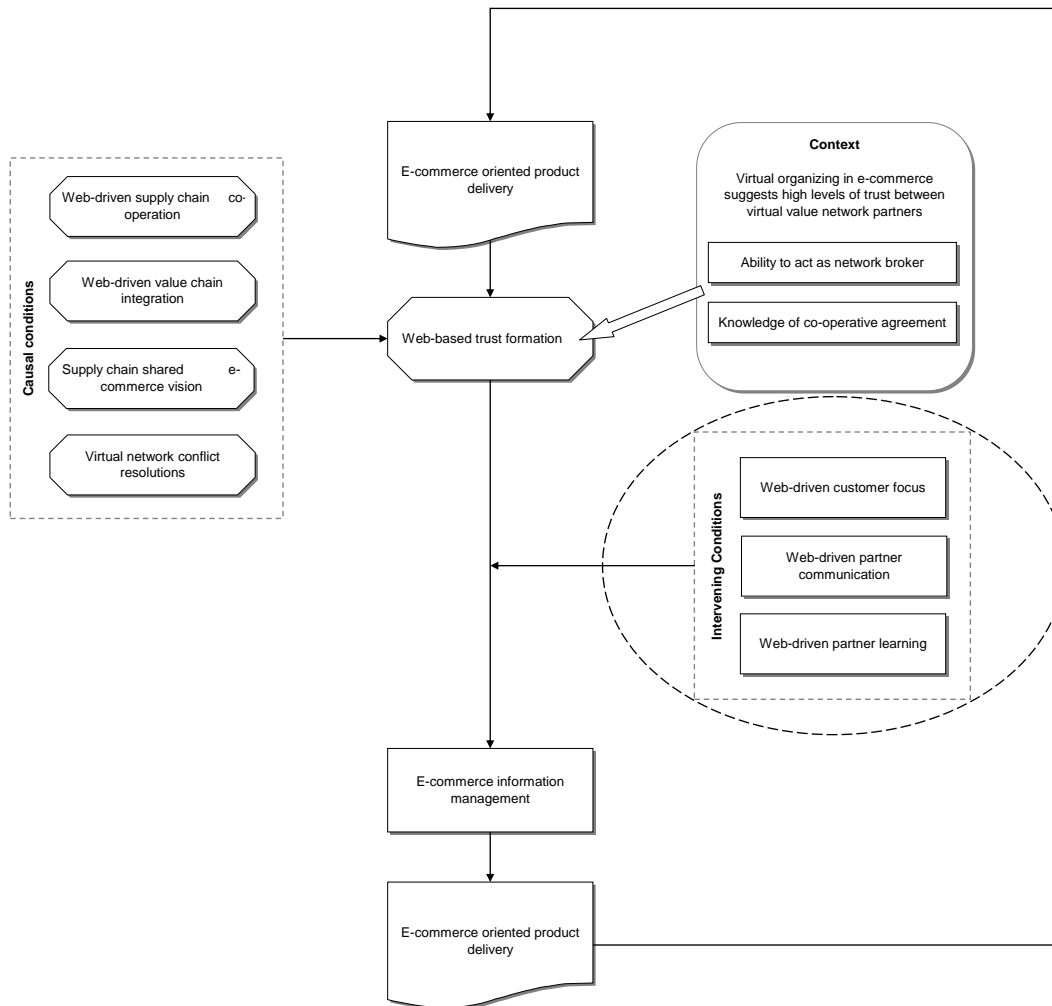


Figure 7.2 E-commerce information management is supported by various networking capabilities

The Dell Computer case study highlights the role of three networking capabilities included in the concluding framework that facilitates and drive effective ‘*E-commerce information management*’, namely, ‘*Web-driven customer focus*’, ‘*Web-driven partner communication*’ and ‘*Web-driven partner learning*’. These will be discussed next.

- a. ‘*Web-driven customer focus*’ is taken to a different level with virtual organizing. The partners in the virtual supply network all take responsibility and are expected to develop and improve their customer

focus. Dell Computers seems to leverage all three factors to maximum potential in supporting effective '*E-commerce information management*'. Statements of Dell such as "*Because what we're all about is shrinking the time and the resources it takes to meet customers' needs*" and "*...we may have to develop new capabilities rather quickly*" suggest a complete customer focus orientation at Dell Computers.

- b. '*Web-driven partner learning*' indicates the need for entrepreneurs and partners in the virtual supply networks to continuously determine and evaluate customer needs in order to translate important and relevant information (obtained through various strategies) into new product offerings in the e-marketplace. '*Web-driven partner learning*' furthermore contributes to the process of making decisions that impact on the virtual value network. Dell's statements, such as: "*One of the biggest challenges we face today is finding managers who can sense and respond to rapid shifts, people who can process new information very quickly and make decisions in real time*", and "*we have to monitor and understand the innovations in the material science world*", as well as "*our job is to take the technology that's out there and apply it in a useful way to meet customers' needs*" confirm a network – wide responsibility to web-based partner learning. Dell Computers also supports customer learning activities, evidenced by Dell's remark: "*...we are able to play more of an advisory role, trying to help our customers understand what the flow of new technology really means, how it will translate into specific products*".
- c. The main contribution of '*Web-driven partner communications*' as an identified networking capability in the framework relates to the effective communication of relevant information to all members of the virtual value network in real-time. The successful implementation of "*Web-driven partner communications*" with virtual organizing activities offers the opportunity to increase the virtual supply network's competitive advantage in the e-marketplace. In other words, communication in the virtual value network and the reaction of the virtual supply network, in response to the

needs of the users, needs to happen in real-time in order to create a lasting competitive advantage in the e-marketplace. Dell states the following: *“With our service providers, we’re working to set quality measures and more, important, to build data linkages that let us see in real time how we’re doing- when parts are dispatched, for instance, or how long it takes to respond to a request for service”*.

The specific propositions (Table 5.10) that relate to the above discussed networking capabilities are:

- The achievement of web-driven customer focus secures effective e-commerce information management.
- Efficient web-driven partner communication will lead to effective e-commerce information management.
- Successful web-driven partner learning leads to highly effective e-commerce information management and thereby effective virtual organizing.

The propositions supporting the framework (Table 5.11) indicate how the introduction of *‘Web-driven customer focus’*; as well as *‘Web-driven partner communication’* and *‘Web-driven partner learning’* support the attainment of highly effective *‘E-commerce information management’*.

Dell states: *“The technology available today really boosts the value of information sharing. We can share databases and methodologies with supplier partners in ways that just weren’t possible before”* indicates how *web-driven partner learning* supports effective e-commerce information management”. Furthermore, when Dell notes: *“This speeds time to market-often dramatically and creates a lot of value that can be share between buyer and supplier”* it indicates how *‘Web-driven customer focus’* in the virtual supply network supports effective *‘E-commerce information management’* which results in the delivery of

value to all members of the virtual value chain that is reached by means of ‘*E-commerce oriented product delivery*’.

Effective ‘*Web-driven partner communication*’ highlights the need for the ‘*real-time*’ communication of demand (users) to all members of the virtual supply network by the entrepreneur (entrepreneurial process). Dell confirms the important link of real time communication of information in statements such as “*We substitute information for inventory and ship only when we have real demand from real end customers*”, and “*Managing velocity is about managing information- using a constant flow of information to drive operating practices, from the performance measures we track to how we work with our suppliers*”. Communication of customer demands in a virtual supply network is of the utmost importance for the entrepreneur who wishes to succeed as a web-based organization in e-commerce.

The entrepreneur implements networking capabilities that enable virtual organizing activities (in the virtual supply network) in order to reach the objective of ‘*E-commerce oriented product delivery*’. The research (Figure 7.3) indicates that effective ‘*E-commerce information management*’ needs to be introduced first by the entrepreneur since it supports the successful implementation of ‘*E-commerce oriented product delivery*’ in the virtual supply network.

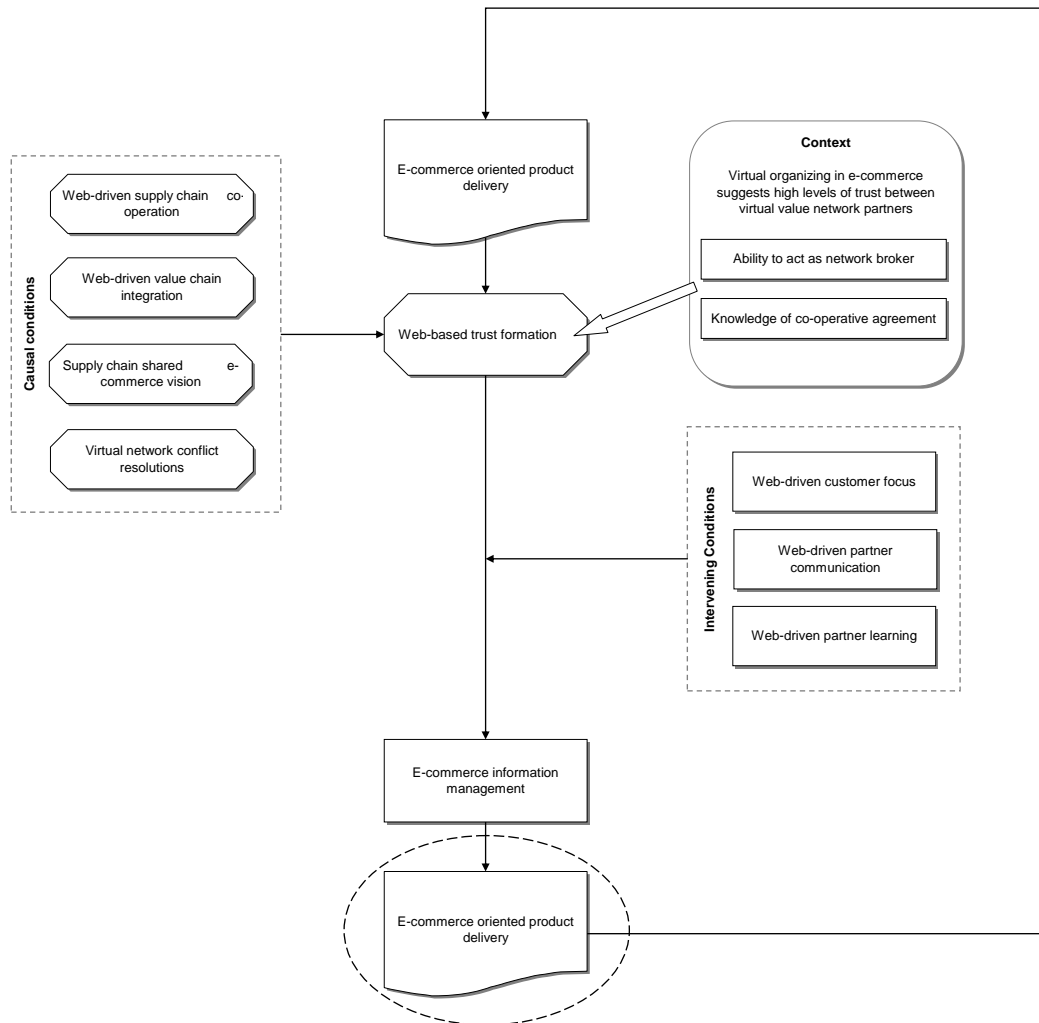


Figure 7.3 The need for successful e-commerce oriented product delivery

'E-commerce oriented product delivery' describes the important outcome of the use of networking capabilities with virtual organizing in electronic markets. The entrepreneurial process indicates how the entrepreneur determines which customers segments [based on effective e-commerce information management] the virtual value network of partners may best serve [with best potential for web-based trust formation] with e-commerce oriented product delivery in electronic markets. The concept of *'E-commerce oriented product delivery'* (see Table 4.1) are validated in the following statement of Dell: *"We really look closely at financial measures like gross margins by customer segments- and we focus on segments*

we can serve profitably as we achieve scale”, confirming the final important networking capability for virtual organizing in the e-marketplace.

The propositions supporting the framework (Table 5.10) indicate that effective ‘E-commerce information management’ will lead to successful ‘E-commerce oriented product delivery’. Magretta states: “The finer the segmentation, the better able Dell is to forecast what its customers are going to need and when. Dell then substitutes strategic information for inventory”.

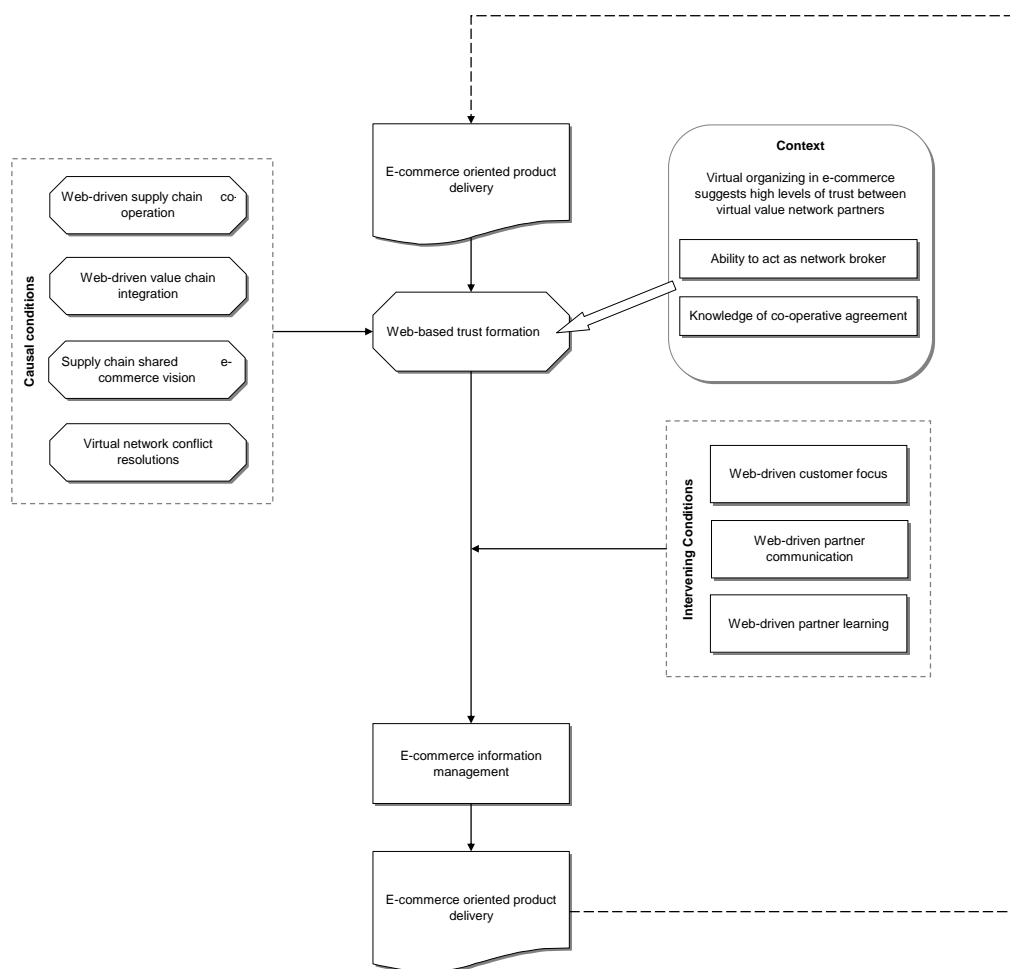


Figure 7.4 Networking capabilities supporting virtual organizations are cyclic in nature

The above discussion demonstrated the application of the theory (i.e., the framework in Figure 7.4) supported by propositions (Table 5.10) and conditions associated with the successful use of networking capabilities in virtual organizing (Table 5.9) to a case study. This was not meant to serve as a validation or test of the theory, but simply to show the relevance and applicability of the theory to a given case. The theory has, however, not only application potential, but could generate or guide further research. The next section addresses this point.

7.6 Conclusion

Chapter 7 concluded the study with an overview and evaluation of the research. The quality of the interpretive research has been assessed by means of the seven principles of Klein and Myers (1999). The theory of the study had also been assessed for its contribution to knowledge with a number of questions of Whetten (1989). In addition, the concluding framework of the study has been validated by considering its application value in the Dell case study.

The main contribution of the research is the concluding framework, developed through the Grounded Theory Method, which facilitates a better understanding of how networking capabilities enable virtual organizing and proved to be effective in providing answers to the research questions. The understanding of networking capabilities was further enhanced by focusing on the entrepreneurial process, when the concluding framework was interpreted using Actor-Network Theory in Chapter six.

The insight provided about the entrepreneurial process and the use and role of networking capabilities in virtual organizing provides a basis for developing strategies to effectively introduce and develop the necessary networking capabilities of the entrepreneurial process. It is hoped that this understanding could assist web-based businesses to enhance their potential for success by developing appropriate strategies.

In conclusion, the research and specifically the theory suggest some opportunities for further research. The substantive theory presented in this study was developed using data from the literature and three empirical case studies. Further development of the substantive theory would require more research to be undertaken across a number of industry sectors to obtain data about actual successful web-based businesses, and to determine how they had harnessed the networking capabilities identified in this research in their efforts at virtually organizing their businesses.



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