Chapter 1

Introduction

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.

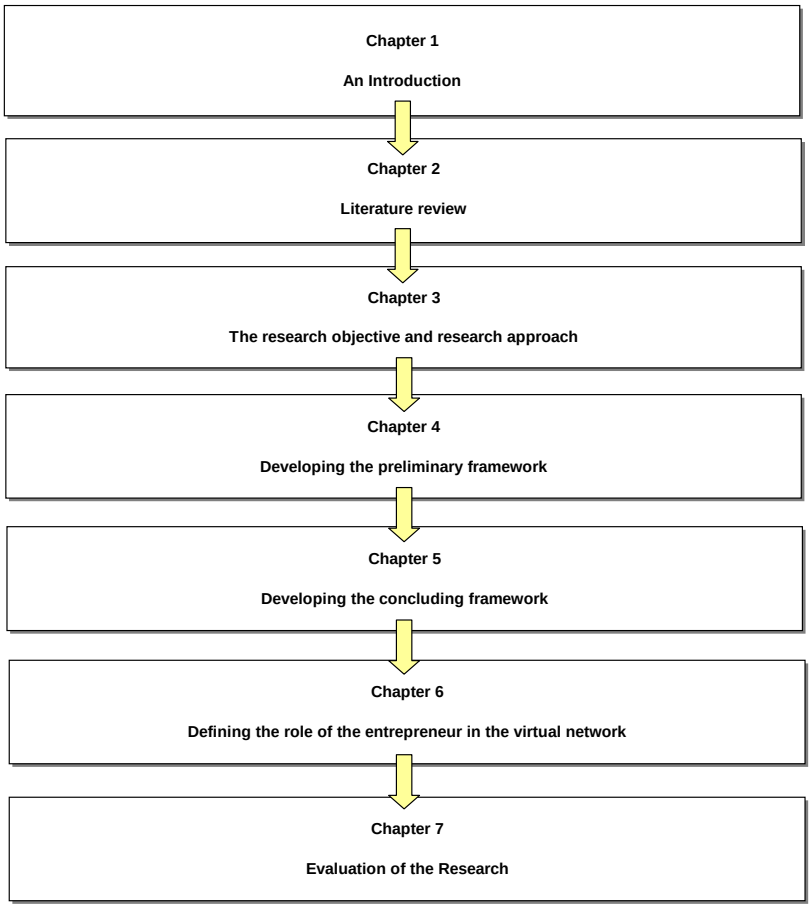

Figure 1.1 A road map of the thesis

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

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.

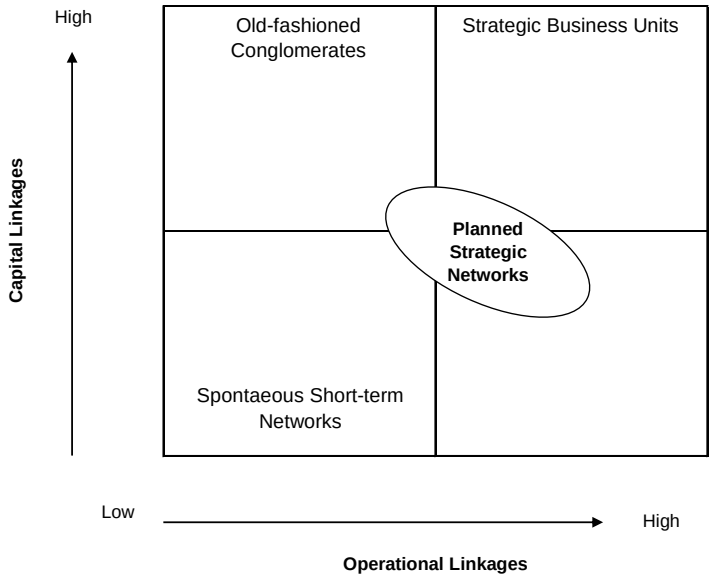

Figure 2.1 Company networks development

(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.

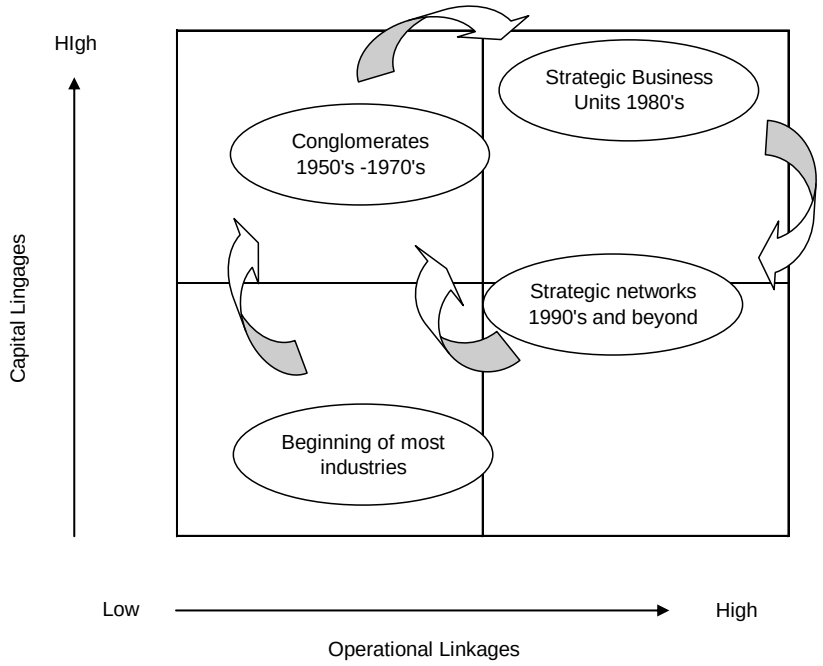

Figure 2.2 Evolution of organizational construct
(Adapted from Hinterhuber and Levin, 1994)

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.

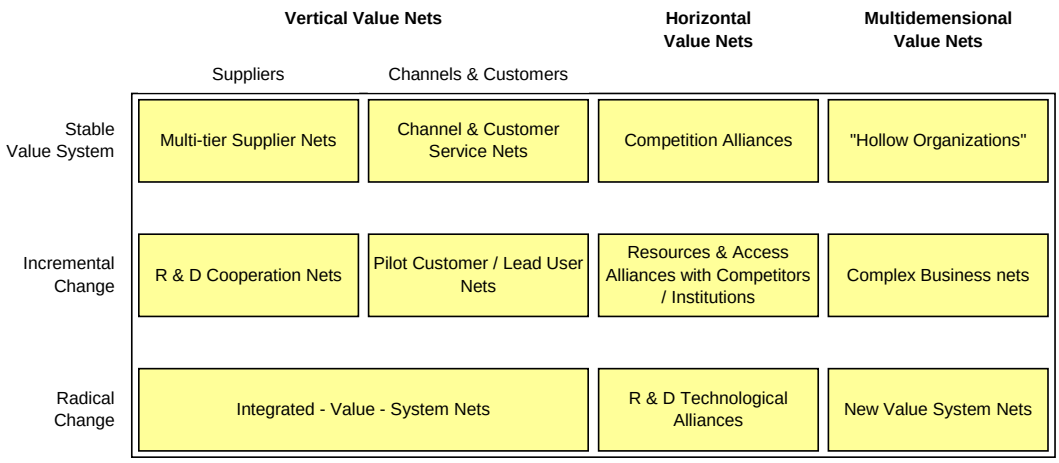

Figure 2.3 Types of strategic networks (Source: Moller *et al*., 2005)

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.

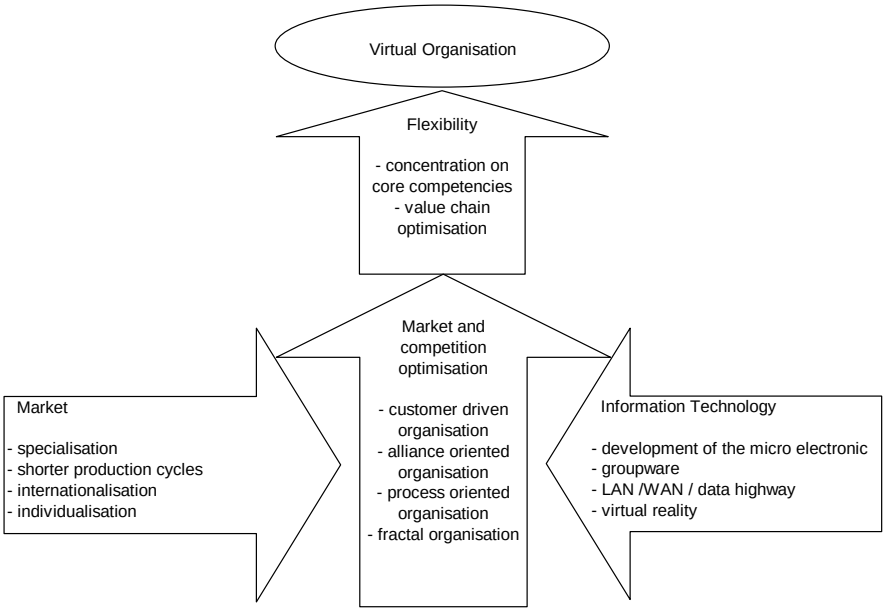

Figure 2.4 Driving forces towards virtual organizations (Source: Mews, 1997)

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. Introna (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) continuous 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 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.

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).

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.

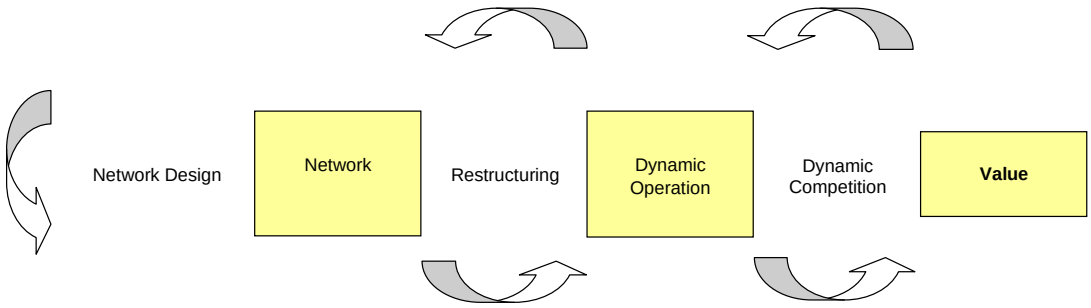

Figure 2.5 A conceptual model of the design and implementation of virtual organizations (Source: Katzy, 1998)

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.

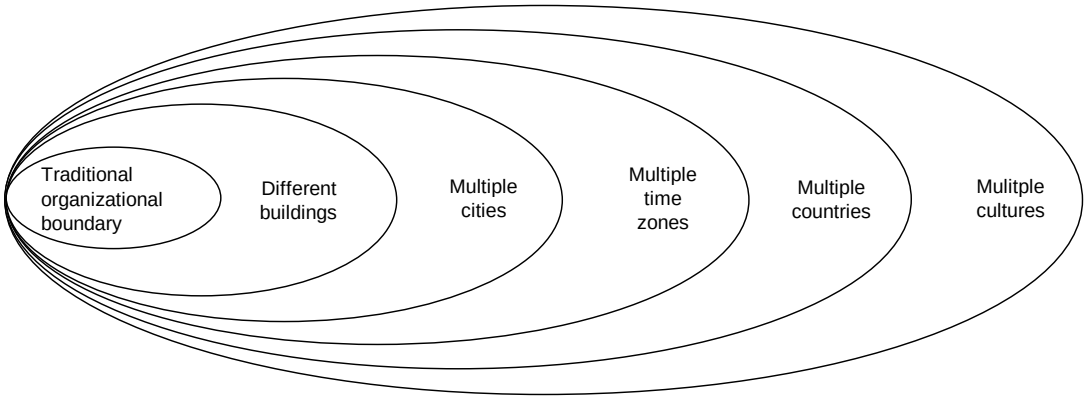

Figure 2.6 Characteristic dispersion of the virtual network organization (Source: Marshall *et a*l., 2000)

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, intergrating 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.

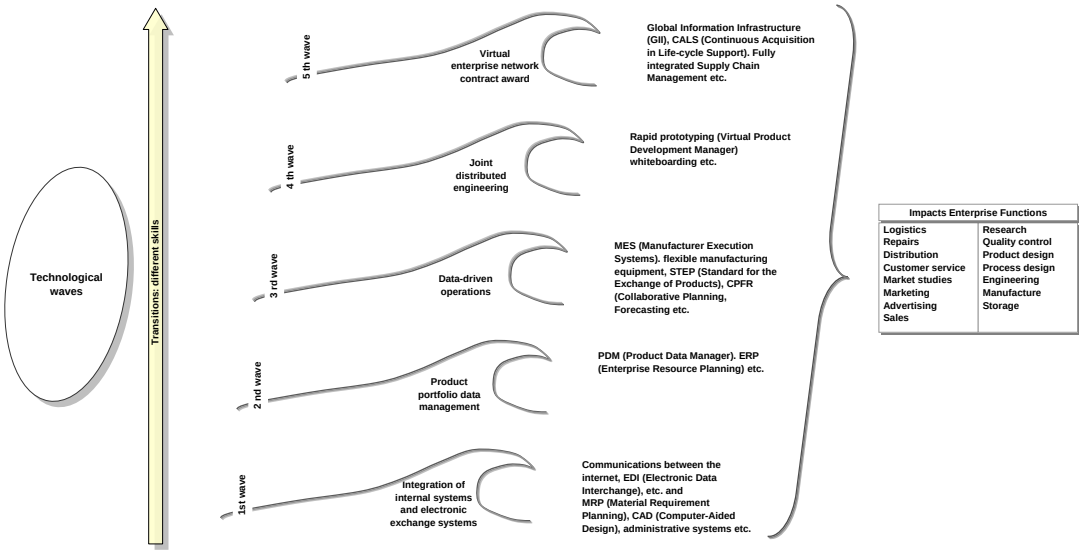

Figure 2.7. Transition from the traditional to the virtual enterprise
(Source: Lefebvre and Lefebvre, 2000)

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 immitatibility, 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.

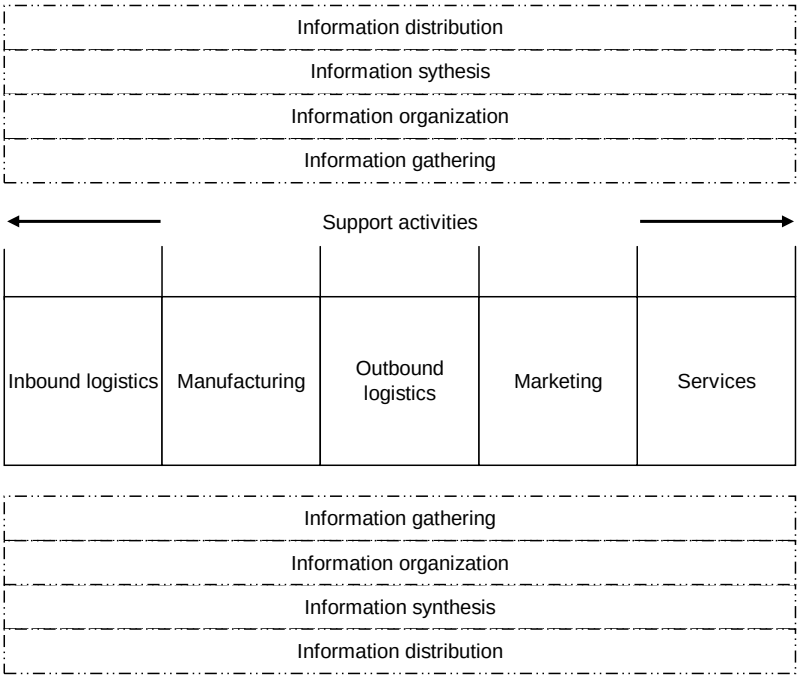

Figure 2.8 Information and its impact on the virtual value chain
(Source: Rayport and Sviokla, 1995)

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 then 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.

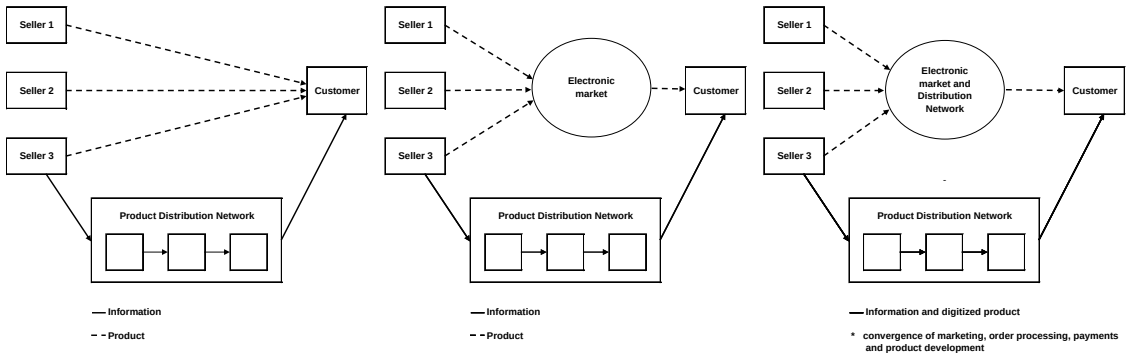

Figure 2.9. Phases in the transformation of the structure of an industry (Source: Strader and Shaw, 1997)

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

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

	Collaborative design efforts to reduce the cost, efficiency, and cycle time of new product development. On-line testing and evaluation of job applicants by human resource departments.	improve marketing efforts. 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.	Procurement efforts using techniques to match buyers with sellers.

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.

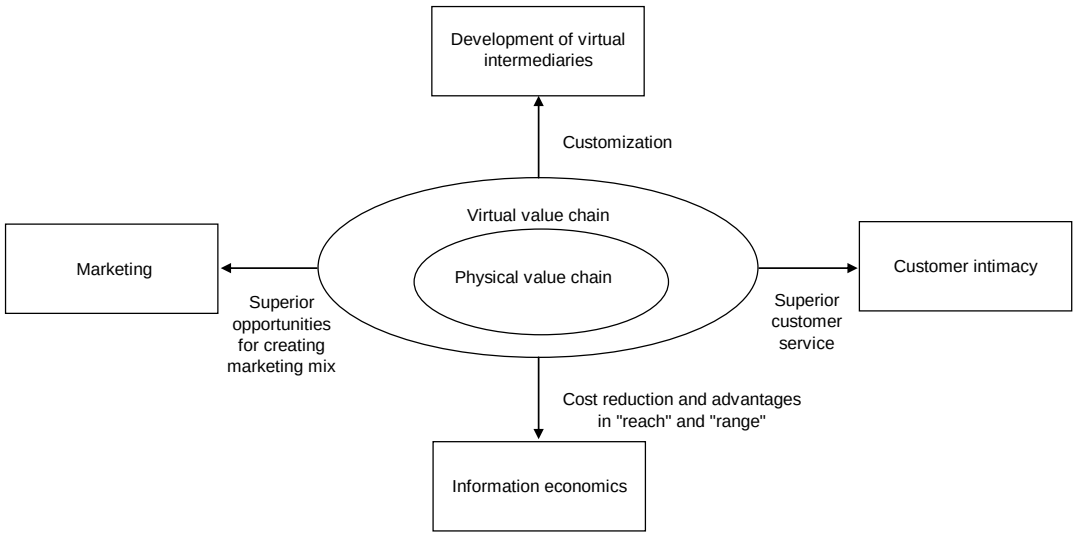

Figure 2.10. Transformation of value-added services through the virtual value chain. (Source: Bhatt and Emdad, 2001)

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.

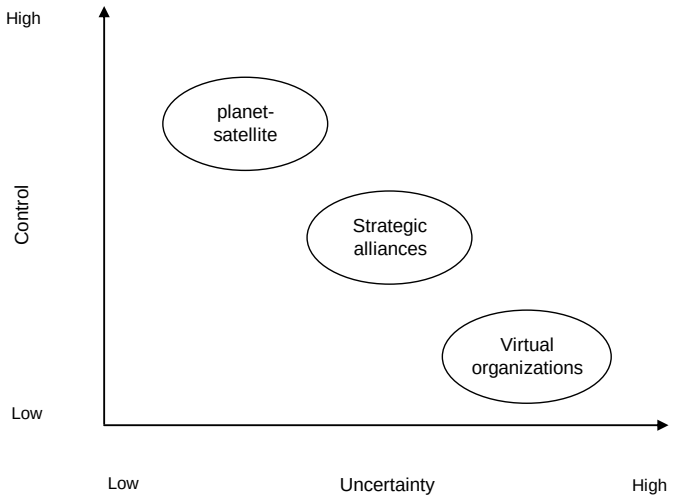

Figure 2.11 Continuum of network organizations
(Source: Jagers *et al.*, 1998)

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 is 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). Dibben (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.

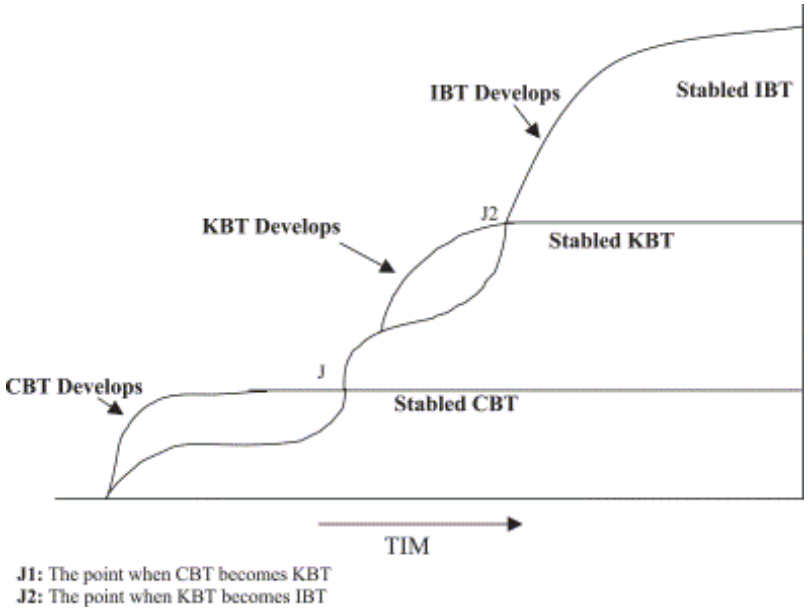

Figure 2.12 The stages of trust development
(Source: Panteli and Sockalingam, 2004)

'*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.

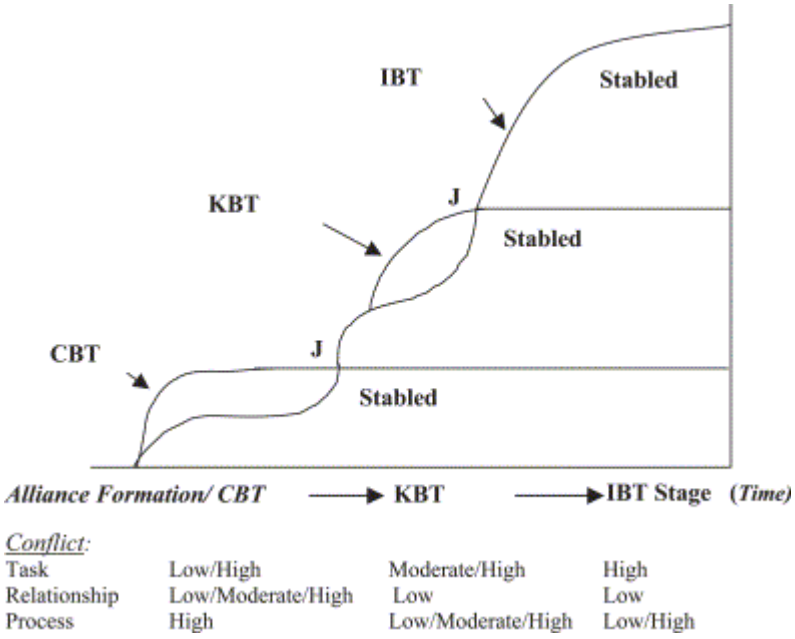

Figure 2.13 Conflict propensity and trust development in virtual alliances – a generic framework (Source: Panteli and Sockalingam, 2004)

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

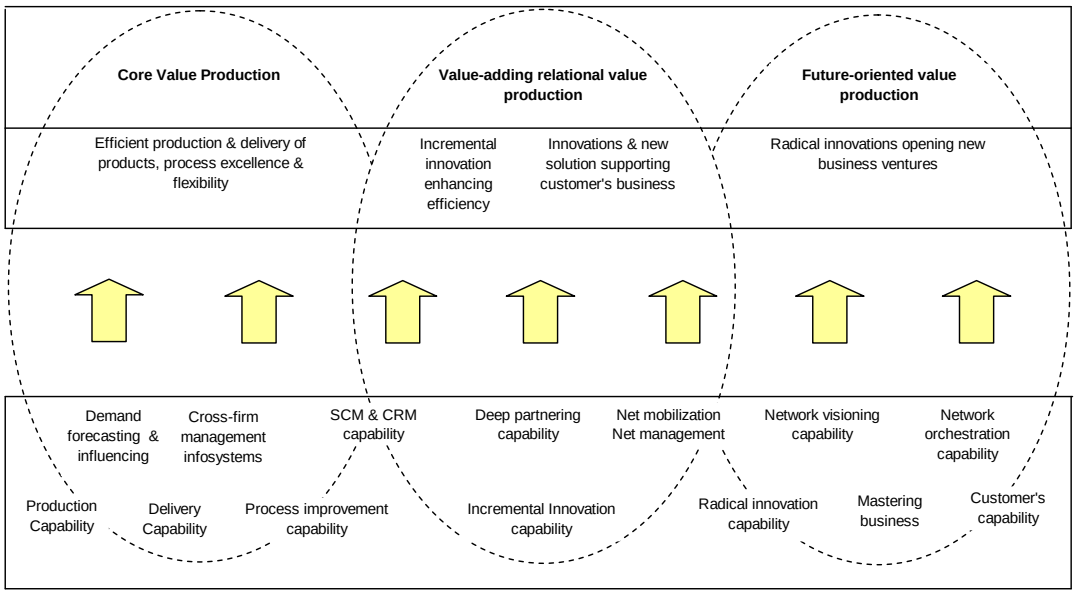

Figure 2.14 Value-system continuum with example networks
(Source: Moller *et al*. 2005)

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 Network orchestration capability	Radical innovation 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.

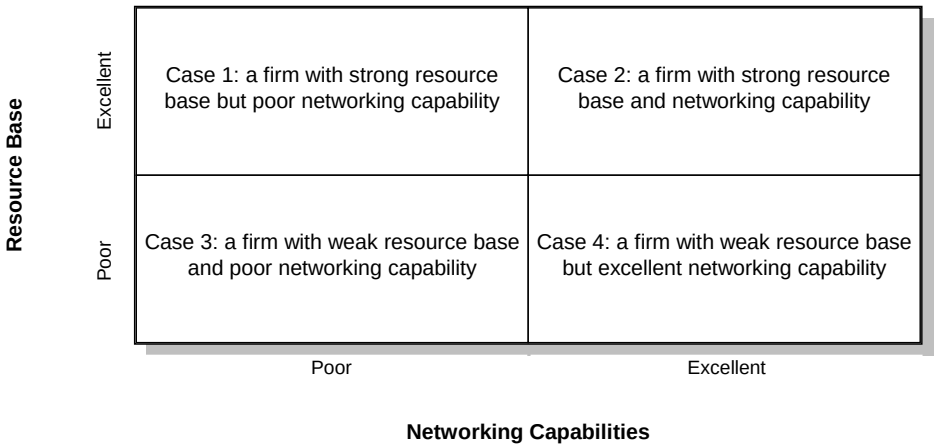

Figure 2.15 A framework for the analysis of network development
(Source: Pikhala *et al*., 1999)

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.