Chapter 3

The research objective and research approach

3.1 Introduction

Chapter 1 presented the research problem as:

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

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

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

3.2 The research objective

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

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

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

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

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

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

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

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

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

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

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

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

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

3.3 The research question

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

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

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

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

3.3.1 Use of the process-based approach

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

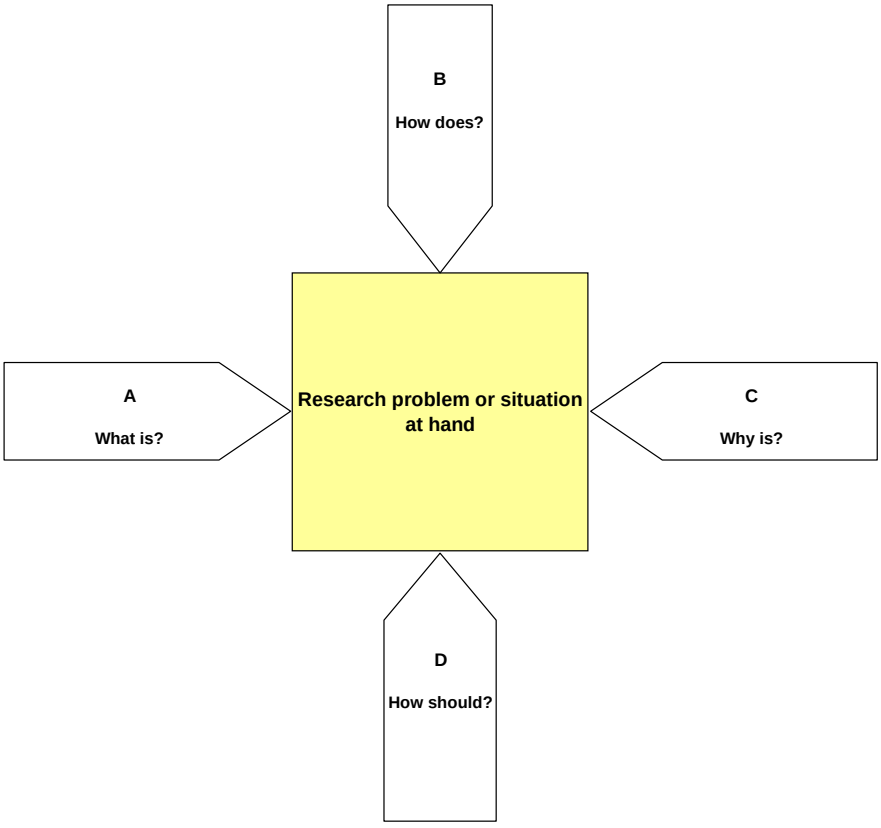

Figure 3.1 Framework for generating low level basic research questions (Source: Roode, 1993)

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

- From the 'What is?' perspective: 'With this question the fundamental nature of essence of the research problem is first explored. The question intends exposing the structure of the problem or the meaning of the underlying concepts or ideas. The purpose is to inquire radically and critically about the problem domain and its accompanying paradigm(s) in order to be able to describe the problem precisely and unambiguously'. This approach to question formulation is underpinned by a fundamental assumption that such universally accepted descriptions for the concepts, ideas and problems do exist.

- From the 'how does?' perspective: 'In answering this question the phenomenon or problem is directly observed and described as it manifests itself in reality. In cases where abstract concepts or ideas are explored, these concepts would obviously not apply'.

- From the 'Why is?' perspective: 'The purpose of this question is to explain the real-life behaviour or characteristics of the phenomenon or problem. In doing so, the focus is on determining relationships between aspects of and/or variables within the problem domain. There is a fundamental assumption underlying this question namely that these relationships can be used to generalize about the problem domain and causal consequences'.

- From the 'How should?' perspective: 'This question focuses on the conclusions, implications and normative aspects of the research results. It is an evaluation of the results or new insights obtained during the research. In some cases it might lead to prescriptive conclusions regarding the problem domain- in other cases it might enhance the understanding of the problem domain or redefine it'.

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

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

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

3.3.2 Categorization of research questions

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

Table 3.2 Exploratory questions formulated using the process-based approach

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

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

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

Table 3.3 Constructing meta questions from the exploratory questions

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

Table 3.3 Constructing meta questions from the exploratory questions

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

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

3.3.3 The main research questions

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

Table 3.4 Constructing the main research questions from the meta questions

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

Table 3.4 Constructing the main research questions from the meta questions

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

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

3.3.4 The fundamental research question

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

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

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

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

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

3.4 Research approach

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

A The choice of an appropriate research approach

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

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

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

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

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

B Generally accepted research approaches in the information systems field

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

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

C Considerations related to the qualitative research approach

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

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

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

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

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

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

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

Characteristics of qualitative research	
• Holistic • Phenomena arise through a multiplicity of origins • Situated • Grounded, typically starting with data and developing theory by induction • Depends on good planning	• Recognizes diversity • Based on fieldwork • Requires adaptability and high levels of cognitive effort, understanding and self-confidence on the part of the researcher • Complex and time consuming

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

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

product of the research.

- Qualitative research is judged using special criteria for trustworthiness.

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

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

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

D The role of the researcher in the qualitative research approach

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

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

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

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

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

The next section considers aspects of the Grounded Theory.

Table 3.7 Capabilities acquired in executing GTM

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

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

3.5 An overview of the Grounded Theory method

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3.5.1 The '*Glaserian*' and '*Straussian*' approaches to Grounded Theory

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

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

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

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

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

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

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

3.5.2 The use of Grounded Theory approach in Information Systems research

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

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

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

3.5.3 The data used

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

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

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

A Literature case used in the development of the preliminary framework

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

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

B Field studies used to refine the preliminary framework

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

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

3.6 Summary

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

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

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

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

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

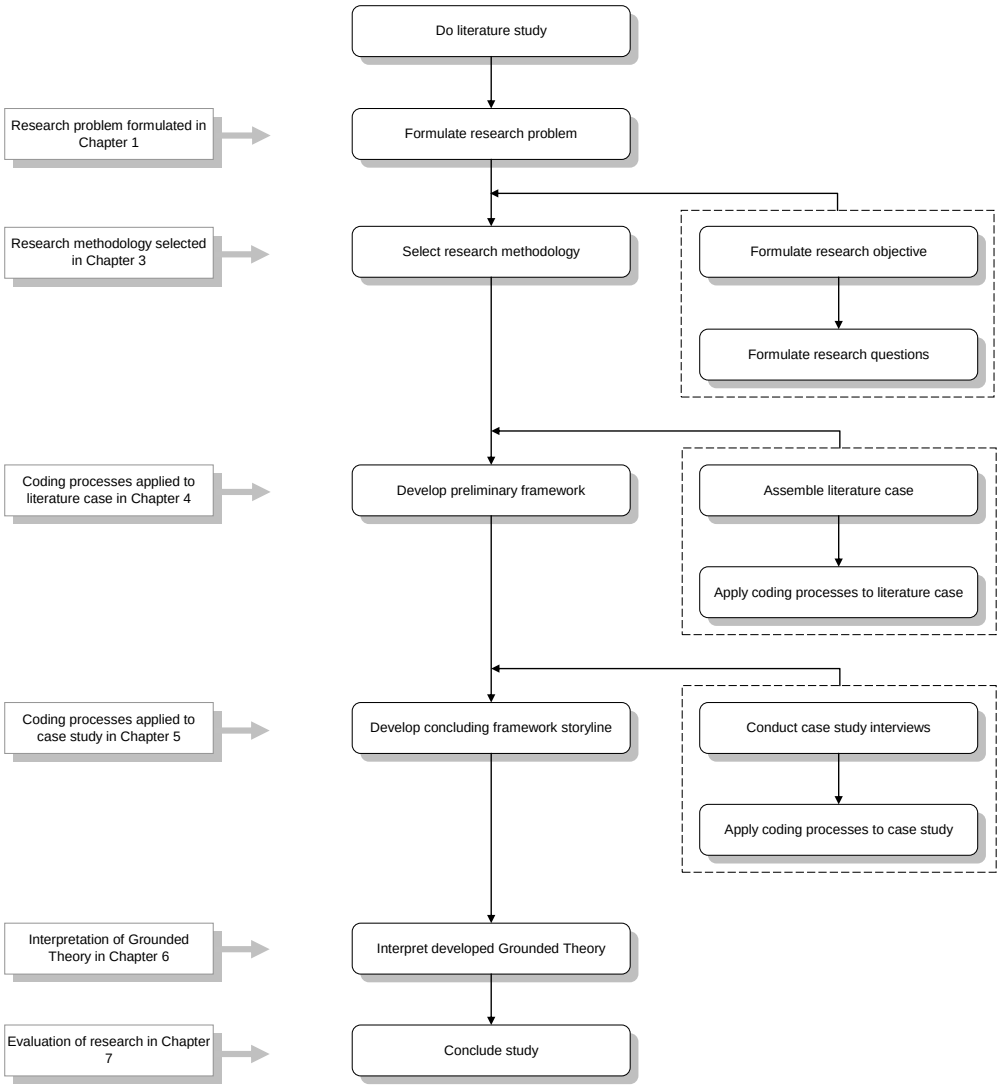

Figure 3.2. The overall research approach

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

Chapter 4

Developing the preliminary framework

4.1 Background

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

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

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

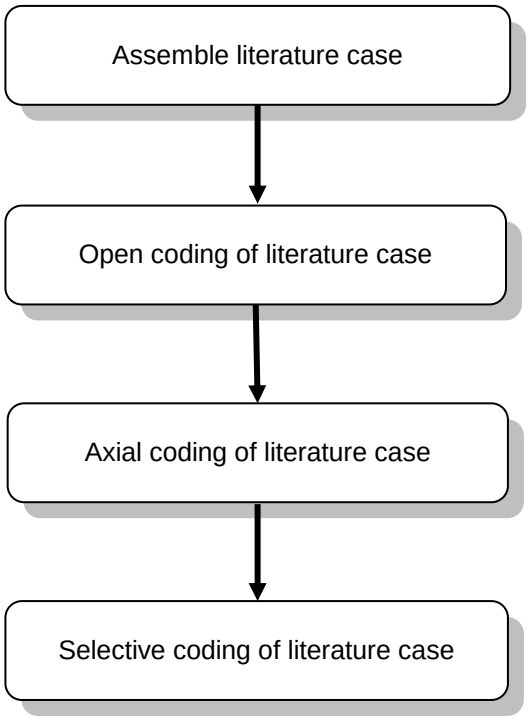

Figure 4.1 Development of the preliminary framework

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

4.2 Preamble to the development of a preliminary framework

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

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

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

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

4.3 Articles used in the literature case

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

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

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

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

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

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

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

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

Caldeira, M. and Ward, J. 2002. *Understanding the successful adoption and use of IS/IT in SME's: an explanation from Portuguese manufacturing industries*. Journal of Information Systems, 12, pp. 121 – 152.

Christiaanse, E. and Kumar, K. 2000. *ICT-enabled coordination of dynamic supply webs.* International Journal of Physical Distribution & Logistics Management, 30 (3 / 4), pp. 268 – 285.

Fitzpatrick, W.M. and Burke, D.R. 2001. *Virtual venturing and entry barriers: Redefining the strategic landscape*. SAM Advanced Management Journal, 6 (4), pp. 22 - 30.

Franke, U. 1999. *Virtual web as a new entrepreneurial approach to network organizations*. Entrepreneurship and Regional Development, 11 (3), pp. 203 - 230.

García-Dastugue, S. and Lambert, D. 2003. *Internet-enabled coordination in the supply chain*. Industrial Marketing Management, 32, pp. 251 – 263.

Jarvenpaa, S., Tractinsky, N. and Vitale, M. 2000. *Consumer trust in an Internet store*. Information Technology and Management, 1 (1-2), pp. 45 – 71.

Kasper-Fuehrer, E. and Ashkanasy, N. 2001. *Communicating trustworthiness and building trust in interorganizational virtual organizations*. Journal of Management, 27, pp. 235 – 254.

Kotha, S. 1998. *Competing on the Internet: The Case of Amazon.com*. European Management Journal, 16 (2), pp. 212 – 222.

Lorenzoni, G. and Baden-Fuller, C. 1995. *Creating a strategic center to manage a web of partners*. California Management Review, 37 (3), pp. 146.

McAdam, R and McCormack, D. 2001. *Integrating business for global alignment and supply chain management*. Process Management Journal, 7 (2), pp. 113 – 130.

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

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

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

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

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

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

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

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

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

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

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

Table 4.1 Reasons for inclusion of publications and articles

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

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

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

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

4.4 Hierarchical processes of coding of the literature case data

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

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

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

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

4.4.1 Open coding of the literature case data

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

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

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

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

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

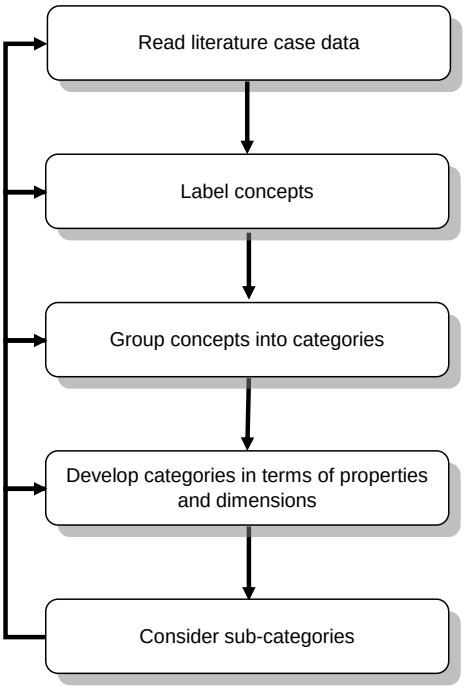

Figure 4.2 Open coding of literature case data

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

Exhibit 4.1 Example of an analysis worksheet extracted from Annexure 1

Category	**Web-based trust formation**

Concepts contained in the category

E-partner interest enhancement	*Innovative e-product development*
Web-driven culture formation	*E-partner profile development*
E-partner relationship building	*E-partner commitment*
E-partner value chain collaboration	*E-partner experience enhancement*
Shared virtual business strategy/vision	*E-partner loyalty*
E-partners risk attitude	*E-partner trust communication*

Properties	Dimensions	
E-commerce value chain relationship	*Individual*	*Partnership*
E-partner business commitment	*Separate*	*Entity*
E-partner Information sharing	*Inaccurate*	*Accurate*
Web-based information exchange	*Irregular*	*Free-flow*
Web-based communication	*Forced*	*Spontaneous*

Sources

Fitzpatrick, W. 2001 ; Franke, U. 1999 ; Jarvenpaa *et al*., 2000 ; Kotha, S. 1998; Lorenzoni & Baden-Fuller, C. 1995 ; Pikhala *et al*., 1999 ; Voss, H. 1996 ; Watson *et al*., 1998 ; Kasper-Fuehrer, E. & Ashkanasy, N., 2001.

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

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

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

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

Table 4.2 The identified categories with relevant concepts

Web-based trust formation	Web-driven customer focus	Web-driven supply chain integration
E-partner interest enhancement	E-commerce customer loyalty development	Web-driven synchronized activities
Web-driven culture formation	Web-based customer partnership formation	Web-driven systems integrity
E-partner relationship building	E-customer value delivery	Service delivery capacity maximization
E-partner value chain collaboration	E-commerce product solution delivery	Web-driven value chain product delivery
Shared virtual business strategy / vision	Web-driven e-partner community development	Information driven inventory turnover enhancement
E-partners risk attitude	Web-based customer-to-customer interaction	Competence/resource utilization
Innovative e-product development	Web-based customer information support	Value chain integrated product delivery systems
E-partner profile development	Web-driven customized needs delivery	Real-time value chain process information exchange
E-partner commitment	E-partner personalized customer interaction	Value chain information broker capabilities
E-partner experience enhancement	Customer value change responsiveness	Value-chain partners minimization
E-partner loyalty	E-product service orientation	Real-time performance measurement
E-partner trust communication		Real-time process system integration
		Supply chain flexibility

Web-driven partner communication	Web-driven partner learning	Supply chain shared e-commerce vision
Web-driven consumer interest intelligence	E-partner quality expertise enhancement	E-partner strategic fit
Web-driven partner relationship building	Web-driven efficiencies enhancement	E-market scale efficiencies
Web-based effective product information exchange	E-partner value chain network formation	E-customer innovative value delivery
Web-based brand enhancement	Web-driven value chain process re-engineering	E-customer loyalty creation
Web-based authoritative product selection support	E-commerce customer value proposition	E-customer focused shared understanding
E-partner specialized information transfer	E-partner learning culture development	E-commerce value delivery change agents
Web-based customer support	Flexible value chain capabilities	Web-driven concept market delivery
Web-driven customer need / relations	E-commerce product innovation	E-partner complementary specialization
Value chain logistics effectiveness	E-commerce customer value shifts identification	E-value delivery differentiation
E-partner strategic information exchange	E-partner skills development	E-commerce innovation leadership
Value-chain information exchange	E-partner market orientation	E-partner innovative product leadership
	E-partner value chain efficiency	E-product value shift response
	E-partner value adding capability	E-market development/penetration
		E-market share enhancement

Table 4.2 The identified categories with relevant concepts (continued)

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

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

4.4.2 Axial coding of the literature case data

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

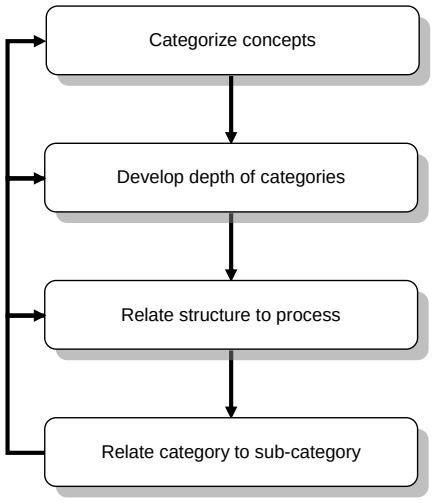

Figure 4.3 Data analysis during axial coding

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

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

Table 4.3 Definitions of networking capabilities

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

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

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

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

Table 4.4. The inter-relationships between categories

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

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

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

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

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

4.4.3 Selective coding of the literature case data

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

The process of selective coding is illustrated in Figure 4.4.

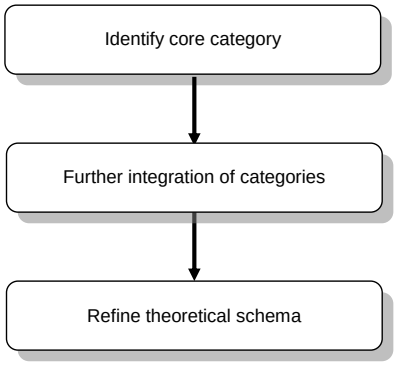

Figure 4.4 The process of selective coding

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

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

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

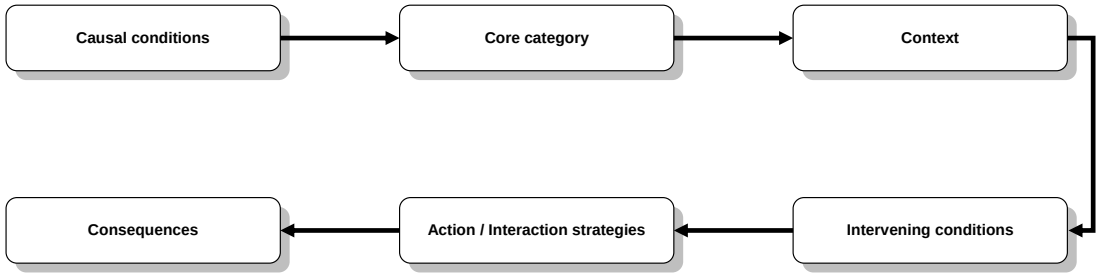

Figure 4.5 Basic features of the paradigm model

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

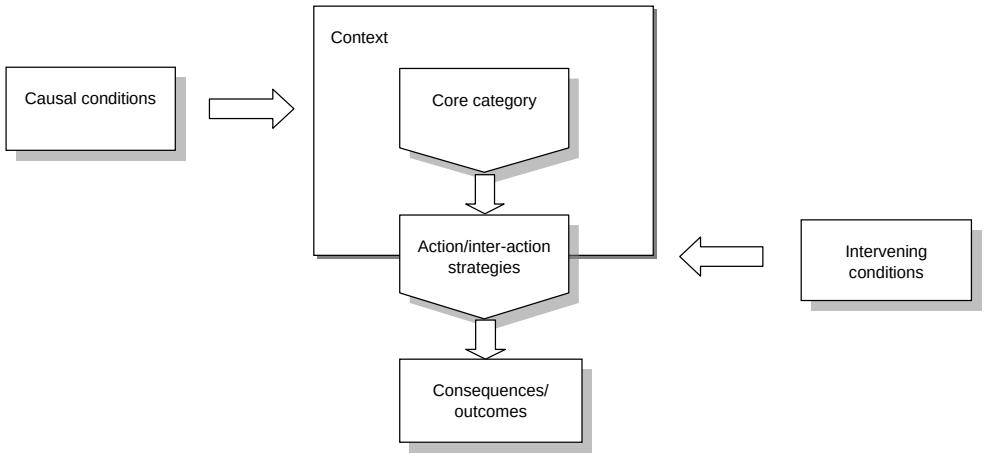

Figure 4.6 Simplified paradigm model (Adapted from Le Roux, 2001)

Table 4.5 The components of a paradigm model

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

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

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

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

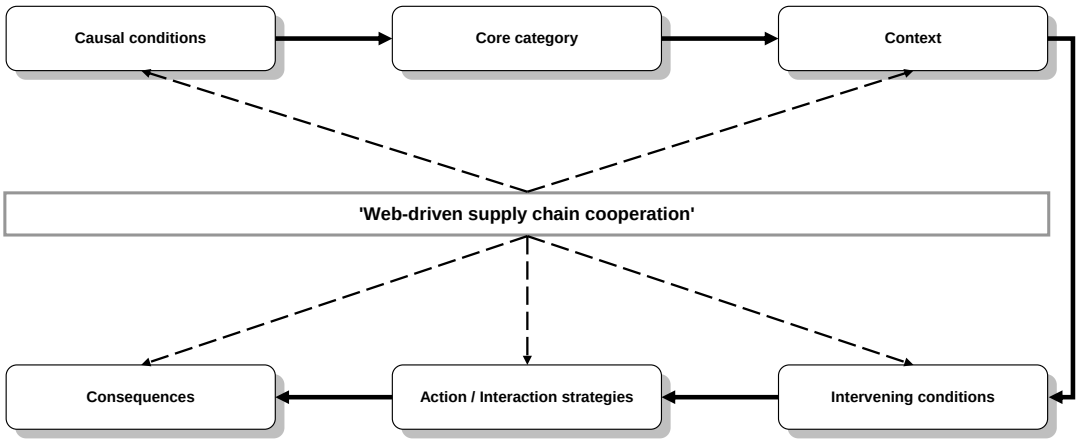

Figure 4.7 Linking a category to components of the paradigm model

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

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

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

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

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

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

Table 4.6 The identified relationships between various categories

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

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

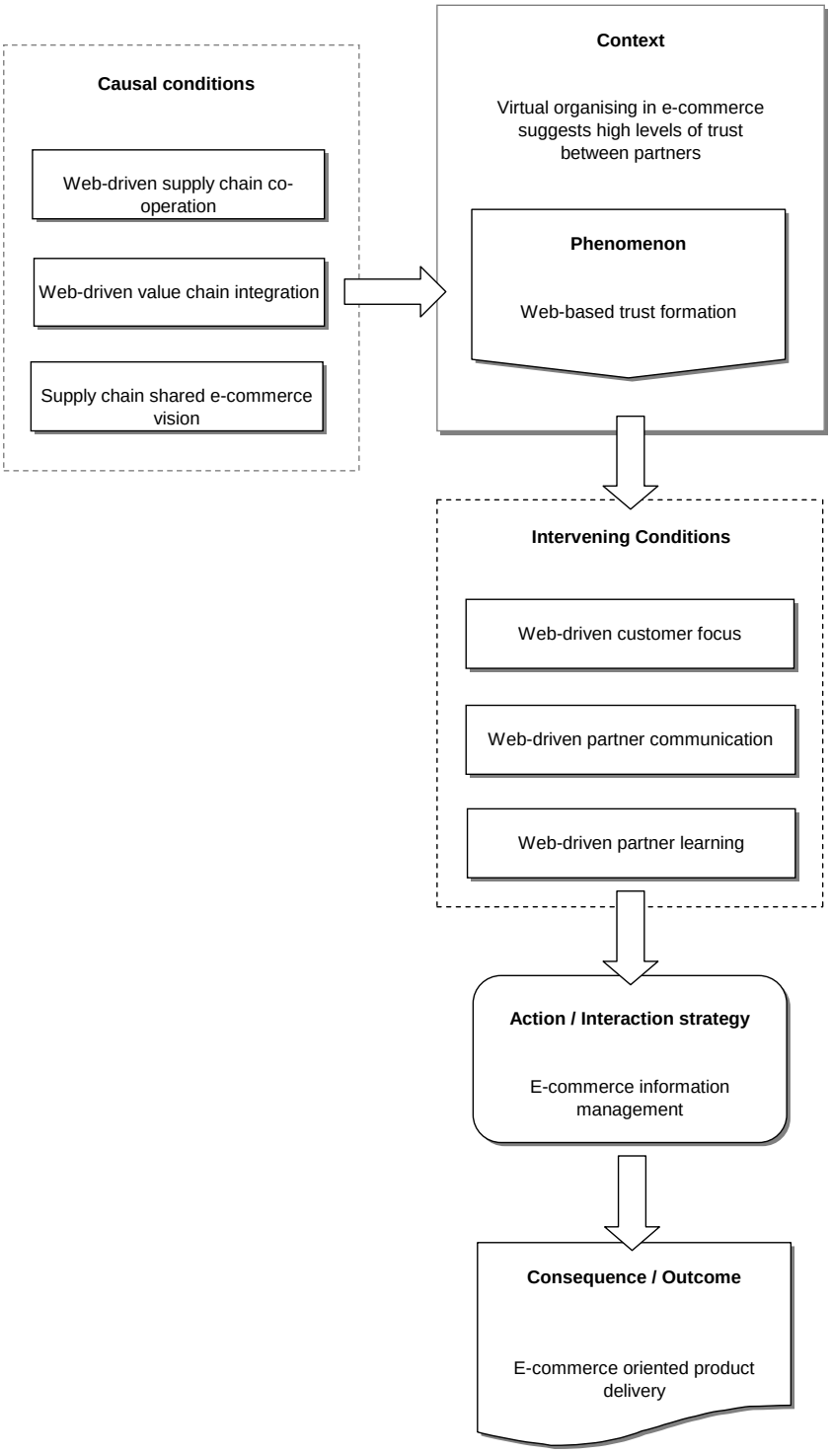

Figure 4.8 The resulting paradigm model of the central phenomenon

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

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

Table 4.7 Propositions generated from the literature case data

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Table 4.8 Conditions associated with successful use of networking capabilities

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

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

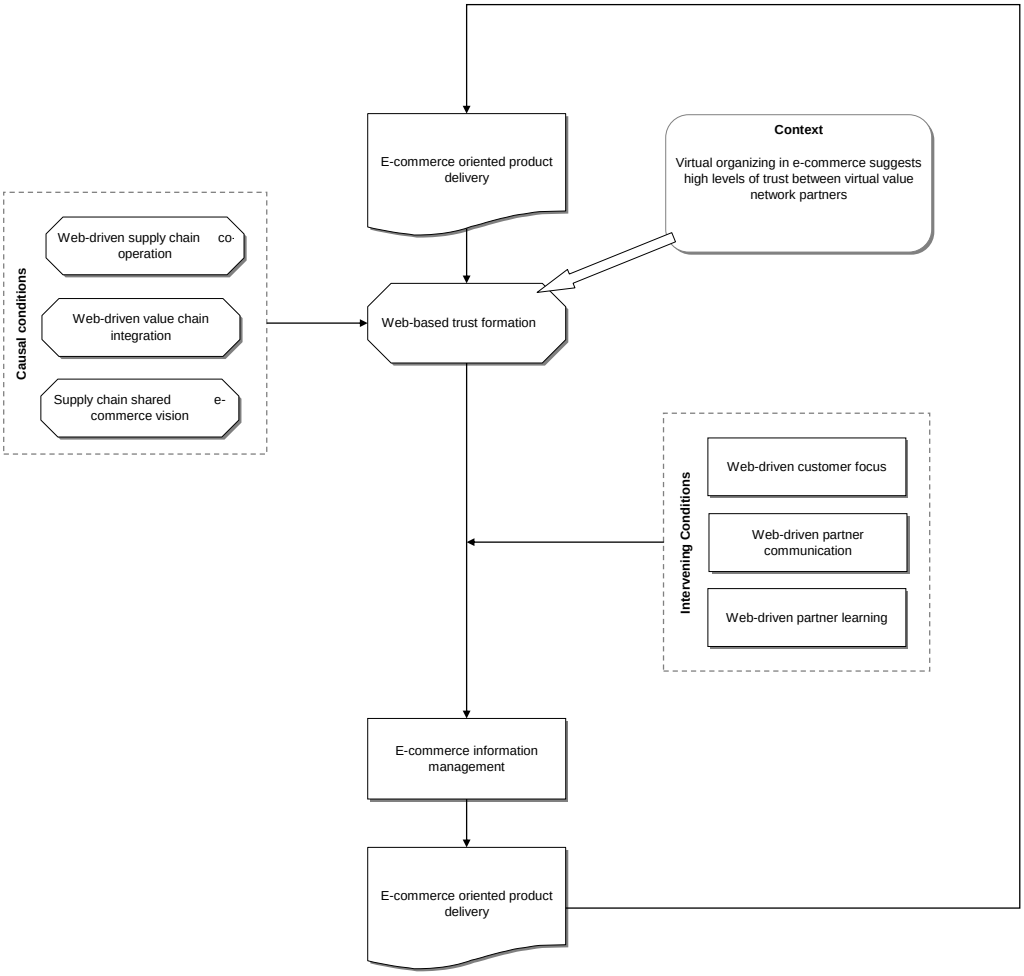

Figure 4.9 The preliminary framework

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

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

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

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

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

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

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

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

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

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

4.5 Implied contribution of the preliminary framework

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

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

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

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

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

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

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

4.6 Summary

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

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

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