INTER-ORGANISATIONAL KNOWLEDGE SHARING BY OWNERS AND MANAGERS OF TOURISM AND HOSPITALITY BUSINESSES OF THE BOURNEMOUTH, POOLE AND CHRISTCHURCH CONURBATION, UNITED KINGDOM: AN ANALYSIS OF THE MOTIVES, INFORMATION CONTENT AND NETWORKING

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A thesis submitted in partial fulfilment of the requirements
of Bournemouth University for the degree of
Doctor of Philosophy

February 2010

BOURNEMOUTH UNIVERSITY
SCHOOL OF SERVICES MANAGEMENT

ABSTRACT

This research study relates to knowledge management within the tourism sector and makes a contribution to the subject matter of inter-organisational knowledge sharing. The tourism sector has been slow to adopt the principles of knowledge management (Cooper, 2006; Cooper and Sheldon, 2010) and there has been focus on knowledge transfer (Shaw and Williams, 2009) rather than on knowledge sharing. Knowledge sharing is a social practice. This research study makes a contribution towards understanding the motives, information content and networking practices of inter-organisational knowledge sharing in the tourism sector.

Theoretical contributions have been made which include: (1) the choice of a model which can be used to show knowledge sharing activities, the knowledge creation theory (Nonaka and Toyama, 2003) and relating the concept of information richness with the I-Space concept (Boisot, 1998); (2) a review and synthesis of a body of social network related theories in regard to embeddedness, structural influence and the innovative characteristics of social networks; (3) an explanation of the systemic features of shared knowledge through social networks as supported by systems, social systems and structuration theories; (4) the integration of theories and concepts regarding knowledge sharing and social networks with a view to better understanding the inter-organisational knowledge sharing practices of tourism businesses.

The research approach combined both attribute and relational data in the same piece of work. Data were collected using a structured questionnaire and survey method. Inter-organisational knowledge sharing relationships were mapped using social network analytical techniques (Wasserman and Faust, 1994). Data were analysed using frequencies, central tendency, inferential, Principal Components Analysis (PCA) and social network measurements.

Empirical contributions were revealed through the discovery of why, how and what business people benefited from, overall and differently, and the examination of the different types of networking practices. As a result, the initial conceptual framework was revised and highlights several knowledge management concepts including: knowledge domain, knowledge specialists, knowledge diffusion, knowledge scanning, knowledge acquisition and knowledge dissemination. Motives were associated with two constructs: (1) social network; and (2) knowledge sharing, and these components enable and facilitate inter-organisational knowledge sharing practices within tourism destinations. Information content and networking were distinguished, network outcomes determined and structural processes measured in terms of embeddedness, structural influence and innovation regarding their potential knowledge sharing capability.

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ACKNOWLEDGEMENTS

I thank my supervisory team of Professor Roger Vaughan, Dr. Jonathan Edwards and Dr. Miguel Moital for their support and encouragement over the years. Their dedication to my work through their much personal sacrifice is highly commendable. I express my sincere gratitude for being awarded a fully-funded PhD studentship by Bournemouth University. Thanks to my colleagues, staff at the School of Services Management and Professor John Fletcher and staff at the Graduate school for their help and listening ear. I also acknowledge the training and development I received as part of the Bournemouth University learning and teaching programme.

Thank you to my family of Hollis and Abigail who were there during my highs and lows of the doctoral process. I specially thank my mother Mrs. Carmen Allen who gave me the encouragement to further my studies.

Thank you to my social network analysis tutor Dimitris Christopoulos. Thank you to the Analytic Technologies team Roberta Chase-Borgatti, Rich De Jordy and Dan Halgin for their help. Thank you to Emeritus Professor Frank Land and Dr. Laurence Brooks for their comments on an early version of my conceptual framework.

CHAPTER 1 INTRODUCTION

1.1 Introduction

Inter-organisational knowledge sharing involves complex processes which occur in the businesses' external environment (Easterby-Smith, Lyles and Tsang, 2008). Knowledge sharing is viewed as an ongoing, reciprocated process by which knowledge stocks are built up. As such, knowledge sharing is an overarching concept to knowledge transfer (flow of knowledge from donor (A) to recipient (B) business). Authors propose that the factors influencing knowledge transfer are those relating to the donor business, nature of knowledge, inter-organisational dynamics and recipient business (Grant, 1996; Easterby-Smith et al., 2008). The donor and recipient business characteristics are internal to the business and the nature of knowledge and inter-organisational dynamics are external to the business.

While the characteristics of the donor and recipient business are important, equally important are the needs to understand how and why knowledge is shared based on the information content and inter-organisational dynamics of social networking? Knowledge sharing means that shared knowledge moves within a network structure (flow of knowledge from point A to B, B to A, B to C and potentially A to C). Hence the reason this research study is about knowledge sharing, which encompasses knowledge transfer (knowledge received by a business from another business). According to Bartol and Srivastava (2002:65) knowledge sharing is defined as, *"individuals sharing relevant information, ideas, suggestions, and expertise with one another."* Knowledge sharing takes place through relationships (Liebowitz, 2007; Marouf, 2007; Yang, 2008) and shared knowledge is assimilated based on absorptive capacity (Cohen and Levinthal, 1990).

The topic of inter-organisational knowledge sharing as a doctoral study is particularly relevant since, firstly knowledge management as a topic is relatively new, having emerged in the 1990s (Easterby-Smith and Lyles, 2003). Secondly, the knowledge management literature on intra-organisational knowledge sharing has been discussed earlier (Musen, 1992; Davenport and Prusak, 1998; Hansen, 1999; Awad and Ghaziri, 2004; Hansen, Mors and Lovas, 2005; Haas and Hansen, 2007; Marouf, 2007) than the knowledge management literature on inter-organisational knowledge sharing (Cross, Parker, Prusak and Borgatti, 2001; Carlsson, 2003; Santoro, Borges and Rezende, 2006). Thirdly, there are concerns as to how knowledge may be acquired and used to achieve organisational goals in a sustained manner (Bennett, 1998; Cooper, 2006). Fourthly, knowledge sharing is not only required within each tourism and hospitality business but also across groupings of businesses for sustained success (Halme and Fadeeva, 2000; Halme, 2001; Hawkins, 2004; Novelli, Schmitz and Spencer, 2006).

In this introductory chapter the context of the research is examined including competitiveness, social networks and knowledge sharing contexts and the aim and consequent objectives are proposed. In order to achieve the research study aim, the quantitative methodology was adopted. This is introduced. Finally, the thesis's structure is outlined.

1.2 The Context of the Research Study

According to Senge, people are *"bound by invisible fabrics of interrelated actions"* (Senge, 2006:7). These actions form a structure which is associated with patterns of behaviour (Senge, 2006). One such pattern relates to the sharing of information through a system of personal and business relationships. Such relationships that business people have may be used to relay information, which is a source of 'know-how' and 'know what' for business people. Information becomes knowledge which is a resource, similar to land, capital and labour (Carlsson, 2003). As a result, people can be the agents of knowledge (Argote and Ingram, 2000) and their inter-relationships with persons outside their business need to be examined if we are to understand inter-organisational knowledge sharing.

The study is based on a systems thinking perspective involving five aspects of information sharing: the input, the process, the content, the output and the outcome. The input is the motive to share information. The process is the way people share information with, in this case, the focus being sharing information through social networking. The content of the inter-organisational knowledge sharing process can be viewed as the relational patterns formed through social networking activities and what is shared in terms of the type of information: technical, managerial, strategic and local information. The output of information sharing is the form in which the information is shared, whether verbal or written, in other words the various tacit-based and explicit-based forms of communication. The outcome is the perceived effect on the business as a result of the social networking process and information sharing content. In addition, both the process (social networking) and the content (information) have motivational and behavioural explanations that form part of the conceptual framework which underpins this study.

Tourism as a subject area lacks discipline status (Tribe, 1997) and new ways of thinking about the tourism sector are needed for the sector's growth and sustainability. Tourism borrows theories and concepts from other disciplines in order to explain how the sector is to grow and develop and one example of this is the Tourism Life Cycle Model (Butler, 1980) borrowed from the Product Life Cycle Model (Vernon, 1966). While such theories can guide the development of our understanding of the tourism sector there is also a need for a deeper understanding of how tourism entities interact and depend on each other. Through understanding these relational processes the tourism sector will enter another dimension that can improve strategies implemented to grow and sustain the sector. Equally knowledge is one resource that can be used to grow and sustain the tourism sector and enhance its competitiveness (Cooper, 2006). Such knowledge resources can be obtained through human and technological interaction (Skyrme, 1999). Human interactions involve social processes, many of which are incorporated social networks. It is therefore feasible to examine how and why social networks facilitate knowledge sharing and what knowledge is shared.

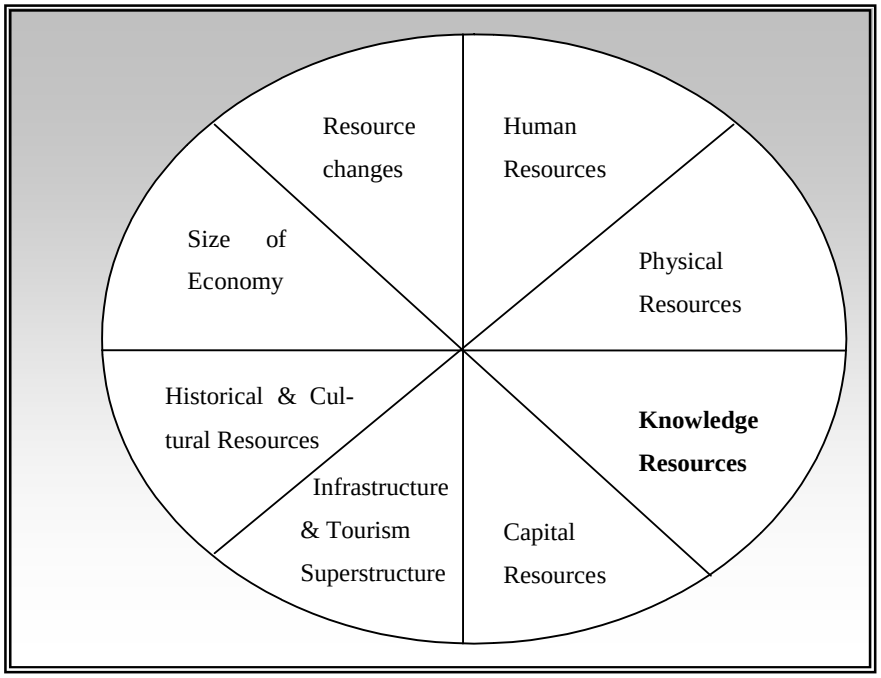
1.2.1 Competitiveness in the Tourism Sector

The tourism sector is comprised of the tourism and hospitality industries. **Tourism** as a concept is defined as *"the processes, activities, and outcomes arising from the relationships and the interaction among tourists, tourism suppliers, host governments, host communities, and surrounding environments that are involved in the attracting and hosting of visitors"* (Goeldner and Ritchie, 2006:5). As accepted by the World Tourism Organisation (WTO), "*tourism comprises the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes"* (Goeldner and Ritchie, 2006:7). **Hospitality** relates largely to the supply-side of the tourism sector of which the accommodation sector forms a major part (Cooper, Fletcher, Fyall, Gilbert and Wanhill, 2005).

Based on the demand and supply activities within the tourism sector, tourism activity is largely interdependent since a range of products and services come together to form a tourism sector and this interdependence affects the competitiveness of the tourism destination. Competitiveness is developed through certain factor conditions: human resources, physical resources, knowledge resources, capital resources and infrastructure (Porter, 1990). Within the tourism context, competitiveness can be viewed as including these factor conditions in addition to tourism superstructure, historical and cultural resources, size of the economy and resource changes (augmentation and depletion) (Ritchie and Crouch, 2003).

Figure 1-1 Competitiveness Factors

Sources: Adapted from Porter (1990) and Ritchie and Crouch (2003)



Knowledge management within the tourism sector brings with it the hope that those developing and managing tourism destinations can become more knowledgeable, with 'know how', and therefore respond to changes within the external environment in a timely manner (Cooper, 2006). As noted above, competitiveness factors include knowledge resources (Figure 1-1). Accordingly, knowledge resources are important for the competitive advantage of the tourism destination as in theory, knowledge may be a stimulus that can transform the tourism system when tourism specific knowledge flows. Knowledge flows create knowledgeable agents who can engage in an adaptive process, which results in the tourism sector re-inventing itself. For example, new knowledge coming into the complex tourism system creates a situation in which the people in tourism and hospitality businesses may make timely decisions and self-adjust to achieve productive outcomes.

Obtaining knowledge provide an information advantage. The need for an information advantage stems from a requirement for the business to become flexible and timely in its response to every 'wave' of change. As a result, the tourism destination is 'first off the blocks' and adapts to changes in the tourism environment (Poon, 1993). A competitive tourism destination may for instance be the first to have a green hotel since the greening of hotels, is currently favoured as it appears to indicate environmental awareness: an attitude tourists are believed to attach importance to. Notions of flexibility (adjusting to change) and timeliness (adapting to change) reflected in the example given have brought awareness of knowledge management to the attention of those working in the tourism sector. Additionally, the need for knowledge is supported by Kozak and Rimmington's (1999) argument that low service levels in the tourism sector are as a result of the lack of knowledge and motivation.

Additionally, competitive advantage comes through the use of information (Porter and Millar, 1985; Choo, 1998). The speed at which information can be processed makes explicit knowledge readily available. Explicit knowledge which involves the processing of information becomes particularly important for achieving business competitiveness. Information is the source of knowledge and the processing of information is the creation of knowledge (Nonaka, Umemoto and Senoo, 1996). Once knowledge is created it may be stored in some form or the other for future creation of more knowledge. By processing information business people become knowledge specialists. Developing people as knowledge specialists makes businesses survive and remain competitive (Drucker, 1998). The creation of knowledge specialists is a central activity of businesses since more knowledge, whether that knowledge is tacit or explicit, becomes available to others (Nonaka, 1998). Generally, businesses which create and share knowledge would achieve sustainable competitive advantage and superior profitability (von Krogh, Nonaka and Aben, 2001).

1.2.2 Social Networks in the Tourism Sector

A social network is based on social ties and it is through these social ties that a structure is formed. The main distinction that is needed is that of a formal and an informal network. Whether formal or informal a social network involves a relationship between agents (Seufert, von Krogh and Bach, 1999). Social networks are formed through various means. Seufert et al. (1999:183) stated,

> *"Networks may result on the one hand through internalization, that is to say, an intensification of cooperation, or externalization in the form of a limited functional outsourcing achieved by loosening hierarchical co-ordination mechanism."*

As such, they suggested that a network is a 'loose' (meaning emergent and not fixed) structure driven by forces of co-operation and co-ordination (Seufert et al., 1999). The network is comprised of a social object, referred to as agent which may be either an ego who is the point of reference or an alter who is any other individual agent (Parsons, 1951).

Social networks are therefore based on relationships. Mutch (1996) posited that in order to manage the tourism sector, of critical importance is not only the technical components but also the construction of relationships within the tourism sector. Social networks may facilitate knowledge sharing and therefore these relationships are important sources of information. There are problems of obtaining new knowledge for people within tourism sector businesses. Knowledge is obtained through collaboration and there is need to create a space (Nonaka and Toyama, 2003) at various times to ensure that people in these businesses obtain information in a timely manner. In view of this, information is obtained through relationships within social networks.

Crucially, the lack of destination information and knowledge poses one of the greatest challenges for the management of tourism destination growth (Ritchie and Ritchie, 2002). There has been much focus on information technological processes (Buhalis and Licata, 2002) but these assets come at a cost. Therefore there is need to understand how other processes of information sharing operate. By examining these other processes that are social rather than technological in nature, a business can understand how relationships benefit from information flows that will improve business performance.

In addition, a plethora of tourism networks on planning and development exist in the tourism sector (Halme, 2001; Tyler and Dinan, 2001; Pavlovich, 2003; Saxena, 2005; Pforr, 2006). Networks are based on one to one and group interaction. Networks can also be based on business or personal reasons. In the tourism sector networks are emerging (Tyler and Dinan, 2001) and generally seek to formulate policy (Pforr, 2006). Thus, tourism practitioners and academics alike are seeking to understand how the tourism sector develops and evolves based on networking activities.

1.2.3 Knowledge Management in the Tourism Sector

Knowledge management can benefit businesses within the tourism sector. Knowledge management is the term used for the creation and dissemination of knowledge in an organisational context (Davenport and Prusak, 1998). The management of knowledge is necessary, both from its creation to dissemination and should not be left to chance (Blumentritt and Johnston, 1999). The challenge is how to create, convert (codify), and diffuse knowledge so that learning takes place. Cooper's (2006) paper about knowledge management and tourism highlights two main reasons why an understanding of networks of businesses and the management of knowledge are important. First, there is need to consider knowledge in an inter-organisational context since previous research in knowledge management has focused on knowledge sharing within organisations. Evidently knowledge sharing between tourism and hospitality businesses, as a topic, had not been examined and published when this research began as up to that time the focus had been within businesses such as hotels (Yang, 2007; Yang, 2008).

Second, based on the fragmentation of the businesses within the tourism sector, knowledge sharing is particularly challenging in light of the sector's human resource practices (seasonality of the sector) and its composition of largely small and medium sized businesses (Cooper, 2006). A sector of this nature has specific issues since knowledge may not readily be available from within the business for the successful operation of the business and thus there is need to look outside the business for new knowledge. This is the case particularly with the hospitality arm of the tourism sector. Hospitality businesses are predominantly comprised of sole proprietorships which may involve a couple operating the business. As a result, business innovation may only be obtained by collaborative mechanisms with other similar businesses.

1.3 Aim and Consequent Objectives

Based on the literature about knowledge management, social networks and tourism, the aim of the research study is: ***to examine inter-organisational knowledge sharing, by considering the individual and group relationships of business people in different tourism and hospitality businesses and focusing on the contribution of social networks to this knowledge sharing***.

The objectives of the research study are:

1) To identify gaps in the literature by a selective review and systematic synthesis of the literature concerning knowledge management, knowledge sharing and social networks, and the relationship of these theories and concepts to the tourism sector.

2) To examine concepts and their relationships in regard to why, why not, how and what inter-organisational knowledge sharing practices take place within the tourism sector.

3) A critical examination of inter-organisational knowledge sharing within a tourist destination using both attribute and relational data.

4) To make a contribution towards building an awareness and understanding of the mechanisms of inter-organisational knowledge sharing within the tourism sector.

1.4 Research Methodology

This research study seeks, through empirical evidence, to examine whether there are inter-organisational social networks of owners and managers in the tourism sector of the Bournemouth, Poole and Christchurch conurbation and whether these social networks facilitate the sharing of information and thereby the building of knowledge stocks. The selection of respondents for the study was based on a sample of tourism and hospitality businesses in the Bournemouth, Poole and Christchurch conurbation. Questionnaire design was based on a consideration of the various types of formal and informal networks and questionnaire administration was a survey method.

Respondents were asked about the specific types of information received, namely technical, managerial, strategic and local. The reasons for inter-organisational knowledge sharing, giving consideration to personality and identity traits, were operationally defined and were measured using a 5-point Likert agreement scale. The Statistical Package for Social Scientists (SPSS) was used to analyse the attribute data. UCINET 6.232 software for social network analysis (Borgatti, Everett, and Freeman, 2002) and NetDraw 2.089 network visualisation (Borgatti, 2002) were used to analyse and illustrate the relational data. The main findings will determine whether social networking allows inter-organisational knowledge sharing and why, what types of information are shared and how this information is shared as a result of respondents' social networking activities.

1.5 Thesis Structure

This thesis critically explains the main theories and concepts of inter-organisational knowledge sharing within the tourism sector and includes literature, methods, results and conclusions in eleven chapters.

Chapter 1 is an introduction and sets the scope of the research study.

Chapter 2 synthesises the characteristics of knowledge, knowledge management models including knowledge creation theory, and knowledge sharing.

Chapter 3 reviews characteristics of social networks and social network related theories including communication network theories.

Chapter 4 discusses systems, social systems and structuration theories, which are used to explain the occurrence of inter-organisational knowledge sharing networks.

Chapter 5 concerns the tourism sector and is divided into two parts. The first part discusses the tourism system and includes agents, boundaries and resources. The second part discusses tourism knowledge networks.

Chapter 6 outlines the quantitative methodology and the social network analysis method which were used to understand practices of inter-organisational knowledge sharing. A research process which involved developing a research problem and approach, conceptual framework, research design, data collection and data analysis was implemented. The research design outlines the rationale for location selection, survey method, questionnaire design, questionnaire content and pilot study. Primary data collection and data analysis including a detailed example of conducting social network analysis are also included.

Research findings based on 200 responses to the questionnaire are reported in three chapters.

Chapter 7 concerns dispositions and attitudes towards inter-organisational knowledge sharing including the reasons for social networking and knowledge sharing. Personality and identity characteristics are examined as the underlying traits of inter-organisational knowledge sharing. Reasons for networking relate to the theories explaining the formation of networks and include interests, contagion, semantic, cognitive, trust, exchange and dependency, homophily, proximity, social support, time and cost. Reasons for knowledge sharing include feelings, preferences, status of knower, prior experience, serendipity, time and cost.

Chapter 8 explains the information content and dissemination processes. The instrumental reasons, types of information and communication methods are analysed to explain what information was shared based on social networking practices. Additionally, the types and forms of information are analysed based on individual and group network types.

Chapter 9 contains elements of networking. These elements include networking characteristics based on whether the respondent was an owner or manager and their networking practices, which are the network types: individual business, individual personal, group formal and group informal.

Chapter 10 is a discussion and evaluation of inter-organisational knowledge sharing. The conceptual and methodological approaches are evaluated. Based on a revised conceptual framework the discussion section sets out: the motives, characteristics and social identity of business people; enablers of social networking and knowledge sharing; network structures and knowledge sharing activities; and creation of tacit and explicit knowledge.

Chapter 11 concludes the thesis with a discussion about the achievement of research objectives, management implications and further research. The thesis's approach is the use of empirical evidence to understand inter-organisational knowledge sharing within a tourism destination.

1.6 Conclusion

This research study is an examination of inter-organisational knowledge sharing within the tourism sector. The inter-relationships of people in a range of tourism and hospitality businesses are examined to determine what type of information was shared and how and why these types of information were shared thereby the research study examines information which becomes knowledge. The context of the research is based on the perception that the tourism and hospitality businesses are fragmented and therefore a complex process of inter-organisational knowledge sharing becomes a difficult if not impossible task. In other words, there are conceptual and methodological gaps as to how and why inter-organisational knowledge sharing takes place and what information is shared, particularly in a perceived fragmented tourism sector.

The first literature chapter is a review of knowledge management, including knowledge sharing, which is the main subject matter of this thesis. While some authors propose models for managing knowledge other authors argue that by its very nature knowledge cannot be managed. Particular attention is paid to tacit knowledge sharing since tacit knowledge is viewed as less easily diffusible than explicit knowledge. In addition, the characteristics, elements and benefits of knowledge sharing are examined to understand the importance of knowledge sharing.

CHAPTER 2 KNOWLEDGE MANAGEMENT AND KNOWLEDGE SHARING

2.1 Introduction

Knowledge is the basis by which all factors of production (land, labour and capital) are applied (Badaracco, 1991). Knowledge management is important since knowledge, when applied, helps businesses adjust to their environment. Arguably, the term knowledge management is preferred rather than information management since knowledge, which is processed data and information, is a resource which when applied achieves business goals. Although knowledge has always existed the idea of managing knowledge is relatively new as a concept, and has largely been developed over the last twenty years. Some of the well-known authors such as Davenport, Drucker, Nonaka, Prusak, Senge and Takeuchi all seek to show the importance of knowledge management within an organisation (Nonaka and Takeuchi, 1995; Prusak, 1996; Davenport and Prusak, 1998; Drucker, 1998; Senge, 2006).

This chapter critically reviews the literature relevant to an understanding of knowledge management and knowledge sharing. It begins (Sub-section 2.2) by establishing the distinction between knowledge, information and data and between tacit and explicit knowledge. Both tacit and explicit knowledge are shown to diffuse using the I-Space (information space) concept (Boisot, 1998).

Several models of knowledge management are then reviewed (Sub-section 2.3) and these models include those relating to an inter-organisational context, which is an open system perspective. Knowledge creation theory is used to explain knowledge sharing and therefore a knowledge sharing model is proposed based on the knowledge creation theory (Nonaka and Toyama, 2003). It is also argued that the form of shared knowledge, tacit-based or explicit-based, is related to the type of communication method.

Knowledge sharing is also reviewed (Sub-section 2.4) to determine the characteristics of shared knowledge, the elements of knowledge sharing and benefits of knowledge sharing. There is a specific focus on tacit knowledge sharing since it is believed that this form of knowledge is particularly difficult to share (Nonaka, 1998).

A conclusion (Sub-section 2.5) summarises the chapter to highlight the key determinants of knowledge management and knowledge sharing.

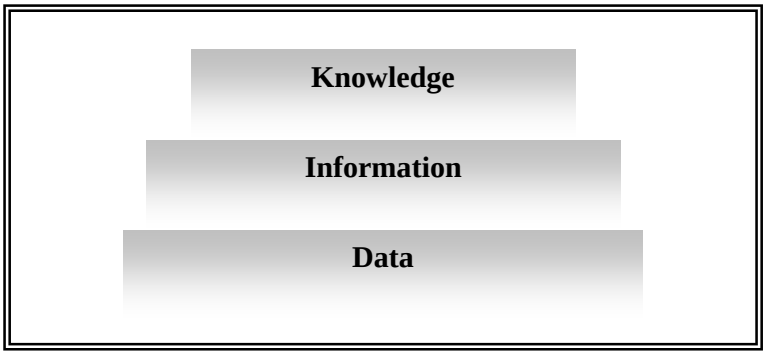
2.2 The Characteristics of Knowledge

This section is divided into three parts: knowledge, information and data; tacit and explicit knowledge; and the information space (I-space) and the purpose is to examine what makes knowledge shareable. It is important to examine characteristics of knowledge since by its very nature knowledge cannot be managed however data and information can be managed (Wilson, 2002). Knowledge involves the mental processes of comprehension, understanding and learning within people resulting from their interaction with the outside world (Wilson, 2002). As a result, managing such knowledge processes is abstract hence the reason there is much confusion about the use of the term knowledge management and this confusion is aided by the loose terminology in the subject area (Beesley and Cooper, 2008). In order to provide clarity, knowledge management is seen as an activity whereas data and information are the objects that are the building block of knowledge management activity and knowledge creation (Beesley and Cooper, 2008). Accordingly, how and why knowledge is managed means that the objects of knowledge, data and information must be examined to understand what makes knowledge sharable.

2.2.1 Knowledge, Information and Data

This section clarifies the difference between knowledge, information and data. These terms are important for those seeking to manage the flow of knowledge resources (Davenport and Prusak, 1998). Knowledge resources may be utilised to build innovative practices and can be grouped together in a knowledge hierarchy (Figure 2-1). Data are facts about activities (Davenport and Prusak, 1998) they may for instance be a record of a transaction. These facts are processed to produce information. Data are transformed to information when it is *"contextualized, categorized, calculated, corrected and condensed"* (Davenport and Prusak, 1998:3). After these data transformation processes, information may then be communicated to recipients.

Figure 2-1 Knowledge hierarchy
Source: Adapted from Skyrme (1999)



Information is a form of communication. That is, information is data that is sent and received, which may be stored for present and/or future use in decision-making. Information transmission refers to the production of information and dissemination of existing knowledge (Rich, 1991). Information is transmitted, picked up, processed and then applied (Rich, 1991). When information is shared it becomes knowledge and therefore knowledge is information which has a particular meaning.

The sources of knowledge are data and information. Both data and information are transformed and become knowledge which is then stored for future use. It is on receipt of information that knowledge is formulated. *"Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information"* (Davenport and Prusak, 1998:5). As a result, knowledge is insight, interpretation, 'know-what' and 'know-how' formulated through processes of comparison, consequences, connections and conversation (Davenport and Prusak, 1998). Knowledge is therefore obtained from information flowing through connections of people in different businesses and results from interpreting information.

Simply put, knowledge, as the term implies, is to know. Specifically, knowledge is not only to know what but also to know how (Prusak, 1996). This 'know how' is embodied in people. As knowledge is embodied in people the issue then becomes one of how to 'dis-embody' knowledge (Spender and Grant, 1996). When knowledge is 'dis-embodied' it becomes information. Thus the vastness of human knowledge can only be communicated as information. In view of this, it becomes important to understand whether the tacit or explicit dimension is more useful. In other words, should knowledge remain tacit and used when needed or should tacit knowledge be converted to information and become explicit which is easier to share?

2.2.2 Tacit and Explicit Knowledge

Considering the knowledge dynamic, there are basically two kinds of knowledge: tacit, which is highly personal, and explicit, which is codified and easily transferable (Nonaka et al., 1996; Nonaka, 1998). There is a need to understand the differences between tacit and explicit knowledge since tacit knowledge is un-codified and not easily expressed and explicit knowledge is codified and can be easily expressed (Polanyi, 1966; Spender, 1996). Tacit knowledge is important since it is needed for strategic deliberations in decision-making (Bennett, 1998). Additionally, knowledge management brings competitive advantage through the use of the tacit form of knowledge and the more tacit the knowledge the more advantageous a firm's position over its competitors (Chakravarthy, McEvily, Doz and Rau, 2003). On the other hand, explicit knowledge is that, which is known, it is understood, reasoned and explained and therefore easily transferable. Explicit knowledge is obtained through the processing of information which provides new knowledge for decision-making.

The complex nature of knowledge makes it difficult to understand what tacit knowledge is all about and in fact how and why this type of knowledge is shared. One argument is that there are two components of tacit knowledge, distal (far) and proximal (near) and these components form the structure of tacit knowing (Polanyi, 1966). An example of the operation of tacit knowing is a recent experience (proximal 'near' knowledge) which is then used to solve a business problem (distal 'far' knowledge). Tacit knowing therefore involves an idea from one context which is then applied within another context (Polanyi, 1966).

The complexity of knowledge is evidenced by Polanyi's suggestion that ones knowledge may be embedded to an extent that it may not be known to oneself. If one does not know ones own knowledge then how can this knowledge be made known as information? As a result, tacit knowledge is innate 'know how.' A fact supported by Polanyi's (1966) suggestion that one knows more than one can tell. It is what we do, not knowing how we know what we do. For instance, decisions made from time to time are often tacit-based. The decision maker decides not necessarily knowing what 'hidden' information, experiences, and events that would have contributed to the decision.

Tacit knowledge is needed to deal with sense-making in a complex organisational environment (Choo, 1998). Sense-making of tacit knowledge is an abstraction data reduction process (Boisot, 1998). As a result, tacit knowledge is the most valuable form of knowledge that an organisation holds (Skyrme, 1999). It is a lack of conscious awareness of the tacit knowledge that has been built up and stored over time that limits an individual's ability to explicate it (Chilton and Bloodgood, 2007). Explicate here means to draw out one's tacit knowledge so that this knowledge can be expressed as information. Tacit knowledge management therefore can be achieved through mechanisms that provide direct access to peoples' tacit knowledge (Spender, 1996). Direct access to people's tacit knowledge helps with making sense of the business environment. Nonetheless, there is concern that people would not want to share their proprietary information (Pena, 2002), although this information is needed for business profitability. If proprietary information is shared, individuals and businesses may then be able to obtain a strong competitive position.

Promoting greater use of a tacit knowledge base is also important since the more tacit the knowledge base of a firm, the easier it is for a firm to defend a competitive position based on that knowledge (Chakravarthy et al., 2003). A tacit knowledge base is facilitated through frequent communication exchanges between experts and dissemination of their expertise (Chakravathy et al., 2003). Additionally, through social networking, a particularly informal process, knowledge remains in a tacit form and so the business is capable of maintaining its tacit knowledge base which is the basis of its competitive advantage (Chakravarthy et al., 2003).

2.2.3 Information Space, the I-Space

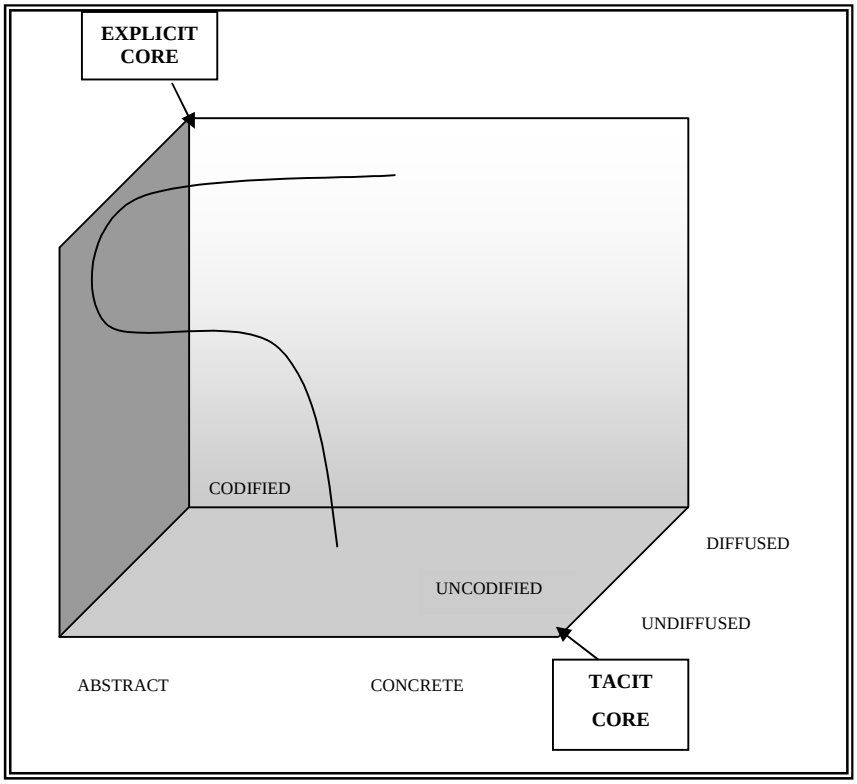
The diffusion of tacit and explicit knowledge has been conceptualised by Boisot (1998) who suggests that tacit and explicit knowledge diffuse in an information space, the I-Space. The I-Space is defined as an area in which codification, abstraction and diffusion of information takes place (Boisot, 1998). Codification which is constrained by time attempts to reduce uncertainty. It is a process based on a person's perceptual and conceptual perspectives. In a computerised sense codification is the shedding of excess data while in a socialisation sense codification may be viewed as taking forward what is really important.

Unlike codification, abstraction goes further and minimizes the number of categories. For example, while codification places data and information into groups and makes associations, abstraction reduces the number of groups and associations. If a tourism business person obtains information about the number of visitors to an attraction, the codification process will, for instance, place in ranking order the level of visitors to this attraction in comparison with other similar attractions. Following codification the abstraction process will, for example, reduce the number of groups into categories of high, medium and low. Abstraction is a process of understanding. When abstraction takes place knowledge is produced.

Boisot (1998) argues that the diffusion of information is facilitated by the processes of codification and abstraction. "*Diffusibility establishes the availability of data and information for those who want to use it"* (Boisot 1998:52). Data and information become available when these are codified and abstracted. The codification and abstraction cycle is a rapid process which results in ongoing conversion of information used to build knowledge. As a result, diffusion is aided by the speed at which the codification and abstraction processes can take place. Arguably, codification takes ***time***, abstraction is based on prior experiences and learning which occur in a particular ***space*** and diffusion is facilitated by ***speed*** of the codification and abstraction processes. Hence, diffusion of shared knowledge engages a time, space and speed continuum.

Figure 2-2 The diffusion curve in the I-Space

Source: Boisot and Child (1999); This author's tacit and explicit core boxes



The more codified and abstracted an item of information becomes, the more this item of information will be diffused in a period of time (Figure 2-2). The curve moves to the left as an item of information becomes more codified and abstracted and at the same time moves upwards as an item of information becomes diffused. As a result, the speed or diffusion of information is the result of the extent of codification and abstraction taking place within the I-Space. The ***speed*** of diffusion is facilitated by several factors: means of communication, sharing of codes (same language and symbols), prior sharing of context, frequency of interaction, urban versus rural setting, cultural dispositions and legal considerations (Boisot, 1998). The means of communication are for instance the tacit-based and explicit-based methods of communication and the sharing of codes are for example the types of information: technical, managerial, strategic and local. These diffusion facilitators have a cost (Boisot, 1998).

The means of communication affects the richness of information. Information richness is defined as "*the potential information-carrying capacity of data*" (Daft and Lengel, 1984:196). The face-to-face medium carries the richest information while documents carry the least rich information (Daft and Lengel, 1984). Face-to-face and telephone conversations are the media through which the rapid feedback provided helps to deal with complex issues (Daft and Lengel 1984). As a result, managers use personal contact to solve unclear problems whereas managers use paperwork communications for routine matters (Daft and Lengel, 1984). Therefore, the means of communication is an important mechanism in the creation of new knowledge for the business and individual.

In summary, an important aspect for understanding knowledge sharing is the form of knowledge and its relationship with the means of communication. Within this research study means of communication have been distinguished as: tacit-based and explicit-based. The link is made based on concepts of I-Space and information richness. When tacit knowledge is drawn out, it becomes information. Certain types of communication carry more information than others. The greater the information-carrying capacity is the more tacit-based the communication means. This is because based on the I-Space concept the processes of codification and abstraction reduces the data within information. As a result, tacit-based means of communication that are less codified and abstracted are more information rich, although less diffusible.

2.3 Models of Knowledge Management

Easterby-Smith and Lyles (2003) note that knowledge management is a relatively new concept and borrows ideas from other disciplines, particularly organisational behaviour and information technology and most of the literature relating to knowledge management emerged after 1996. However, they also identified that the most frequently cited works before 1996 are by Argyris and Schon (1978), Nelson and Winter (1982), Levitt and March (1988), Cohen and Levinthal (1990), Senge (1990), Brown and Duguid (1991), Huber (1991), March (1991), Kogut and Zander (1992) and Nonaka and Takeuchi (1995) (Easterby-Smith and Lyles, 2003). As a result, knowledge management theory has been recently developed.

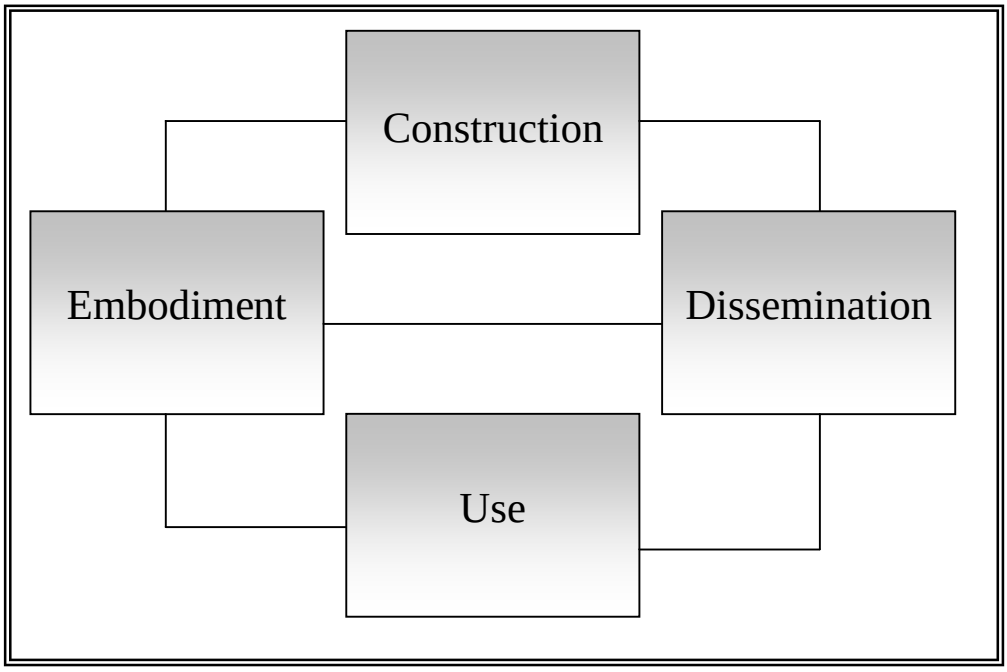
The focus on knowledge management (KM) results from a paradigm shift from an industrial society to an information society, from national economy to world economy and from hierarchies to networks (Naisbitt, 1984). These shifts facilitate an information revolution. The information revolution is affecting organisations in three ways: changing industry structure by creating niche opportunities; creating competitive advantage through lowering cost, enhancing differentiation and changing competitive scope; and spawning whole new businesses (Porter and Millar, 1985). Coupled with the information revolution and society is the possibility of information overload and irrelevance and therefore there is a need to obtain relevant information that will improve business performance and success.

Generally, the processes of knowledge management, whether that knowledge is tacit or explicit, involve: creation, storage/retrieval, transfer and application (Alavi and Tiwana, 2003). These knowledge management (KM) processes have resulted in the proposition of several models of knowledge management. These models may be regarded as an evolution of sorts, moving from knowledge management components, through to a focus on knowledge management within organisations, then on to knowledge management between organisations and later to an inside and outside organisations approach to knowledge management. As a result, there are three groups of knowledge management models: (1) those based on a closed system wherein the focus is intra-organisational, (2) those based on an open system wherein the focus is inter-organisational and (3) those based both on closed intra-organisational and open inter-organisational elements.

2.3.1 Closed Systems Models

An early knowledge management model was that of Demarest (1997). This model of knowledge management considers four elements: embodiment, construction, dissemination and use (Demarest, 1997). Embodiment is a process of placing the constructed knowledge in a container. Such a container may be viewed as being either human or non-human. Construction may be viewed as a process of putting things together and thereby discoveries are made. Dissemination is the process of releasing embodied knowledge and use means that knowledge is applied to bring about some benefit.

Figure 2-3 Demarest's Knowledge Management Process
Source: Demarest (1997)



Demarest's (1997) model suggests that the organisation engages in knowledge management through explicating tacit knowledge by converting it to explicit form and this is then disseminated through human and technical processes. These processes, in turn, are used to bring commercial value to the business and customer. The model, however, does not consider the complex environment within which an organisation exists. In terms of managing knowledge, one has to consider particular characteristics of a business's external environment since these characteristics may determine the business's survival.

2.3.2 Open Systems Models

Knowledge management may also be achieved through an open system, which involves an inter-organisational knowledge sharing process. Knowledge crosses organisational boundaries spanning the knowledge network (Swan, Langford and Watson, 2000; Hansen, 2002). The knowledge network view has been spawn by the fact that organisations have evolved from boundary to boundary-less entities, to become fluid and flexible (Ilinitch, D'Aveni, and Lewin, 1996; Spender, 1996; Scott, 1998; Schneider and Somers, 2006). One open systems model is based on the type of knowledge to be managed. Open organisational systems generate two kinds of knowledge: the individual tacit-based, knowledge (private good) and the social explicit-based, shared knowledge (public good) (Spender, 1996). The challenge that knowledge management has is to move knowledge from the individual to the social (Figure 2-4).

Figure 2-4 Types of Knowledge

Source: Spender (1996)

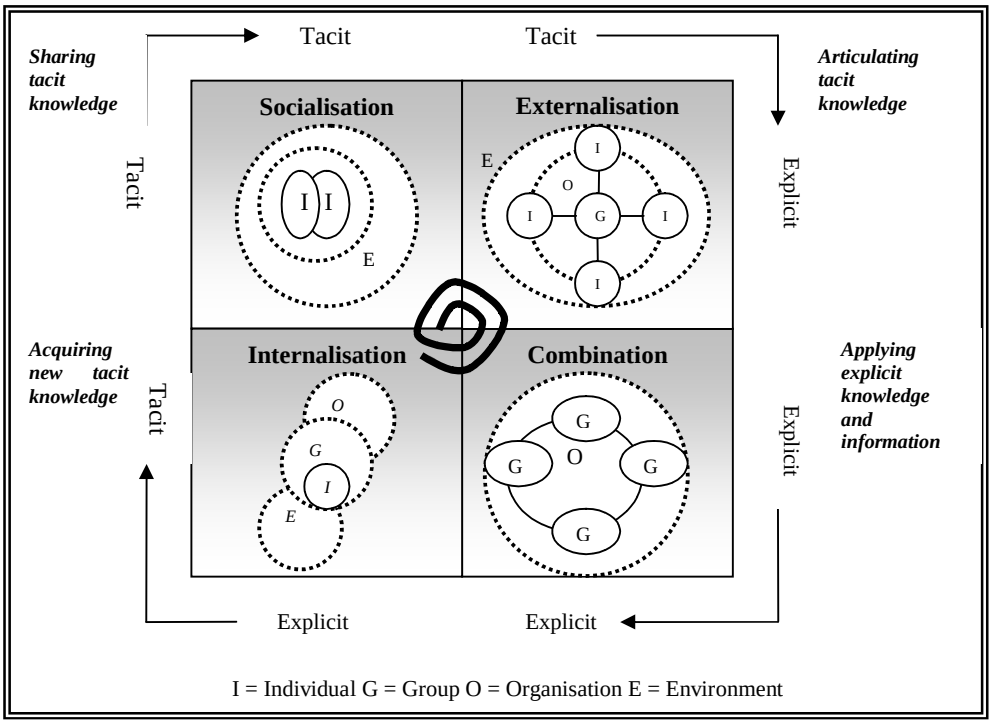
	INDIVIDUAL	***SOCIAL***
EXPLICIT	Conscious	Objectified
IMPLICIT	Automatic	Collective

Based on the type of knowledge, the Spender's model (1996) involves four processes: interpretive flexibility; boundary management; identification of institutional influences and the distinction between systemic and component features. Interpretive flexibility means that within open knowledge systems there are various specialists who can contribute to the knowledge base. Boundary management is needed for dynamic knowledge systems since business processes may be influenced by several external entities. These influences must be identified and the influences of the system, such as human knowledge and influences of component features, such as the level of technology should be distinguished.

Another open systems model is based on the concept of the social network. Social networks are influenced by dynamic capabilities, absorptive capacity and the gift economy (Cohen and Levinthal, 1990; Carlsson, 2003). First, dynamic capabilities are developed through combining and using resources and engaging knowledge management processes: acquisition, dissemination and use of knowledge resources. Dynamic capabilities are built up when knowledge is shared through social network mechanisms. These mechanisms are used for environmental scanning and strategic information purposes. Second, absorptive capacity was conceptualised by Cohen and Levinthal (1990) and is viewed as the capability to understand and apply new knowledge. As argued by Kogut and Zander (2003) businesses operate within social communities specialising in the creation and dissemination of knowledge (Kogut and Zander, 2003), and therefore it is suggested that these social communities aid absorptive capacity. Third, the gift economy, which is a type of exchange system, means that knowledge is shared as a gift (Carlsson, 2003). Knowledge is shared based on an influence to give back, rather than the value of the knowledge being shared. The gift economy contributes to understanding the concept of knowledge sharing (Choi and Hilton, 2005) and the social network is therefore a knowledge sharing tool.

Figure 2-5 Knowledge Creation Model

Source: Nonaka and Toyama (2003)



The knowledge creation model is an open systems model and may be viewed as a process which results in new knowledge being produced. Knowledge is created through the processes of converting information through a series of tacit and explicit forms (Nonaka and Takeuchi, 1995). Nonaka and Toyama (2003) revolutionised thinking about how knowledge is created and utilised (Figure 2-5). The organisation is not machine-like in terms of processing information but rather it exists in an organic form (Nonaka and Toyama, 2003). As a result, created knowledge is context specific and is facilitated by relationships with others inside and outside the business.

Nonaka and Toyama (2003) argue that knowledge is created when it is shared through tacit and explicit forms as some sort of spiral (Nonaka and Toyama, 2003). They propose that there are four knowledge creation processes: socialisation, externalisation, combination and internalisation. The top left box of the diagram relates to tacit to tacit knowledge conversion which is also called socialisation and involves the sharing of tacit knowledge. Socialisation occurs when tacit knowledge is obtained, for example, through a face to face conversation. The next box on the top right hand side represents tacit to explicit knowledge conversion which occurs when there is dialogue and as a result tacit knowledge is articulated. This articulation may for example, be the result of sending an e-mail and hence this form of knowledge conversion is called externalisation. Combination occurs when the explicit knowledge is implemented. Internalisation occurs when explicit knowledge is absorbed and the individual learns. Knowledge creation is an activity and the created knowledge is disseminated based on some kind of communication process (Chua, 2001; Beesley and Cooper, 2008). The creation of new knowledge within the individual and by extension the business are related to the various tools of communication, for example face to face conversation, written documentation, telephone conversation, electronic mail, electronic discussion and video conferencing.

Knowledge management in an open systems model has been explained by Jackson (2005) and involves four processes: the knowledge creation spiral, knowledge-enabling characteristics, 'Ba' (a space created for discussion) and dialectics (Jackson, 2005). The knowledge creation spiral (Nonaka and Toyama, 2003) shows the tacit and explicit knowledge conversion processes. Knowledge enabling characteristics are the conditions for knowledge creation which are brought about by certain stimuli such as changing market conditions. 'Ba' is the context within which knowledge is created and dialectics are the creative discussions which enable creation of new knowledge. A business environmental stimulus results in knowledge being created through a spiral of creative discussion within a certain context which then becomes shared knowledge.

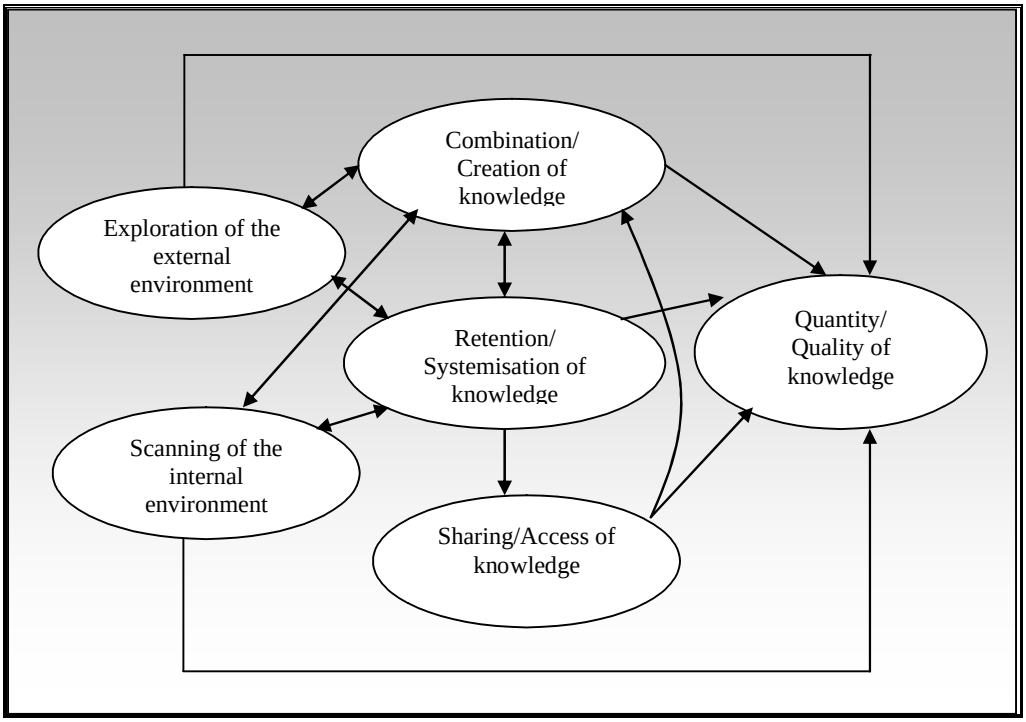
A complex adaptive system is another example of an open systems model. A complex adaptive system view of knowledge creation and dissemination considers the broader organisational dynamics and it is illustrated as an organisational system that is open to information flows or stimuli, and adjusts processes and outcomes to suit the stimuli. Within a complex adaptive system there is maintenance and growth. System maintenance relates to the processes of relational structures and competencies and system growth is based on the strategic direction of the business (Jantzen, 2002). Through relationships new knowledge is created as a response to a stimulus (Sherif and Xing, 2006) and therefore relationships result in knowledge sharing which in turn facilitate the creation of new knowledge.

2.3.3 Integrated Closed and Open Systems Models

A new knowledge management model, which brings together the intra-organisational and inter-organisational elements of knowledge, was proposed by Diakoulakis, Georgopoulos, Koulouriotis and Emiris (2004). This integrated model comprises the processes of retention-systemization of knowledge, sharing-access of knowledge, combination-creation of knowledge, exploration of the external environment, scanning of the internal context and the use of knowledge (Diakoulakis et al., 2004) (Figure 2-6). The model is both a closed and open systems model since both the external and internal environment are examined. The model also links knowledge sharing with knowledge creation. Based on the model, created, absorbed and shared knowledge are the pre-requisites of the quantity and quality of knowledge.

Figure 2-6 Holistic Knowledge Management Approach

Source: Diakoulakis et al (2004)



Models of knowledge management were reviewed and assessed based on their knowledge sharing conceptualisation. First, knowledge management involves the effective sharing of knowledge. While adoption of technological advances may aid the management of knowledge within businesses, there is also need to understand how the flow of knowledge can be managed between businesses using processes that are rather social. Social practices are rather organic in nature and may be viewed as simply talking with and writing to other people. Second, within the literature, recognition is given to the fact that businesses are affected by their external environment. People in businesses obtain information which improves the knowledge base of individuals within these businesses. As a result, an open systems model of KM has been adopted within this research study. The main advantage of an open system model of KM is that both system components and system resources can be examined within a broader context of an external environment.

2.4 Knowledge Sharing

This review of knowledge sharing is divided into three parts: (1) the characteristics of shared knowledge; (2) the elements of knowledge sharing; and (3) the benefits of knowledge sharing. Knowledge sharing is a knowledge management activity. The sharing of knowledge, communicated through information, from the tacit to the explicit forms, has been examined by several authors (Schermerhorn, 1977; Nonaka and Takeuchi, 1995; Bennett, 1998; Choo 1998; Davenport and Prusak, 1998; Skyrme, 1999; Rogers, 2003; Awad and Ghaziri, 2004; Uzzi and Dunlap, 2005). Knowledge is built through information (Awad and Ghaziri, 2004) hence we may say that knowledge is shared when information is disseminated. The process is called knowledge sharing since there is a basis for exchanging information, which means that the other person in the knowledge sharing relationship may in turn share their information. Knowledge sharing processes inside and outside businesses are seen as essential goals for any business (Easterby-Smith and Lyles, 2003) because businesses operate within a dynamic external environment.

2.4.1 The Characteristics of Shared Knowledge

The characteristics of shared knowledge include: embodiment, fluidity, and intangibility. Embodiment relates to how the knowledge is stored, fluidity relates to the viscosity of knowledge being shared, whilst intangibility relates to the perish-ability of shared knowledge. These characteristics can be examined to understand what makes knowledge flow from one person to another.

2.4.1.1 Embodiment

Embodiment is an important characteristic of shared knowledge. Given that knowledge is embodied in organisational practices (Spender and Grant, 1996), knowledge sharing becomes difficult when businesses are unsuccessful in their ability to share knowledge embodied in organisational routines. There are two views as to how knowledge becomes embodied, an inward view and an outward view. An in-ward view has to do with inertia in which knowledge embodiment is based within organisational practices. Knowledge sharing in the inward view is based on the idea that organisational knowledge is developed through people, tasks and tools (Argote and Ingram, 2000). Knowledge developed through these interactions is difficult to share outside the organisation since this knowledge is least likely to fit the new context (Argote and Ingram, 2000). The outward view is based on the idea that organisations innovate through inter-organisational collaboration (Powell, Koput and Smith-Doerr, 1996). Inter-organisational collaboration means that networks of organisations provide new knowledge which transforms organisations within the networks.

2.4.1.2 Fluidity

Fluidity may be viewed as knowledge coming without one knowing it is here, it goes before it is noticed and then it may be lost forever. Fluidity, which relates to viscosity, is a feature of shared knowledge. Viscosity means thick and sticky (McKeown and Summers, 2005). Knowledge therefore possesses certain properties which make it become thick and sticky. The more viscous the knowledge the less it will flow. Fluidity is facilitated by certain forces acting to enable or constrain the flow of knowledge. Fluidity means that knowledge is like a river, no one knows if the river will take particular channels. Such channelling depends on the volume, the landscape and the gravity of the river flowing, and so it depends on the volume of knowledge, the connectivity of the channel, the capacity of the knower and the pull or attraction of the knowledge.

2.4.1.3 Intangibility

Knowledge is **intangible** (Diakoulakis et al., 2004; Choi and Hilton, 2005). Its intangibility means that it is highly perishable. Perishability makes the importance of managing the asset more crucial. In terms of a strategy for managing an intangible item, the functions of management, such as planning, organising, co-ordinating and controlling may no longer be relevant. Managing knowledge means that the knowledge flow process must be understood. If the process is viewed as a system, then managing knowledge is like managing a system and therefore the creation of knowledge is a determinant of the system and not linked to its intangibility. For instance, if an organisation knows that being placed in a particular structural position or being connected to certain agents, allows it to create new knowledge, then the fact that knowledge is intangible becomes irrelevant. The conceptualisation of structural positions to facilitate knowledge creation is particularly important and explains the sharing of knowledge between businesses.

2.4.2 The Elements of Knowledge Sharing

Main elements of knowledge sharing are: the size of business, the cost and social processes. These elements set the parameters of knowledge sharing activity.

2.4.2.1 Size of Business

Within small and medium sized businesses knowledge and decision making are concentrated in a few key persons. Obtaining new knowledge may become difficult depending on the size of the business which can influence a number of factors that themselves affect the process of knowledge sharing and these factors include: similarity of tasks; source of knowledge; perception of an opportunity to share knowledge; execution of sharing such as absorption; individual motivation; social network ties; tools and technology; and cognition (Argote and Ingram, 2000). For example, within a large business presumably with more people, there are greater opportunities through more social network ties for sharing knowledge both inside and outside the business.

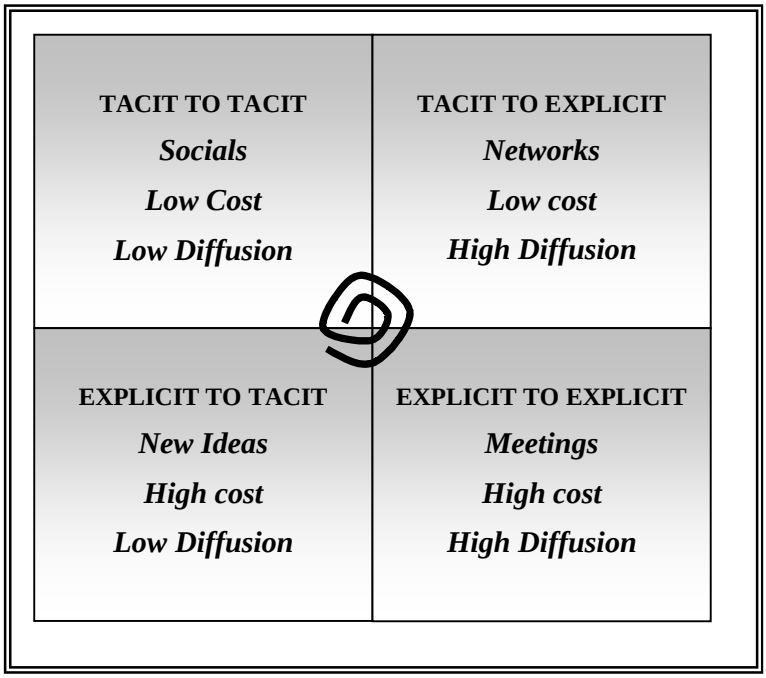
Certain characteristics of small and medium-sized enterprises (SME) may facilitate obtaining new knowledge such as appreciation of individual and shared understanding, possession of an effective knowledge base and system, integrated and contextualised action, and effective learning processes (Sparrow, 2001). In theory therefore, developing new knowledge in SME is based on individual competency, team work and learning (Sparrow, 2001). These characteristics of SMEs are linked with factors which affect knowledge sharing and one such characteristic is for example, individual competency facilitates the absorption of knowledge.

2.4.2.2 Cost

Cost refers to the costs incurred in converting tacit knowledge into an explicit form and vice versa. A cost can be assigned based on the businesses' knowledge strategy which is the allocation of resources to share knowledge (von Krogh et al., 2001). While the cost of implementing a knowledge sharing strategy may be high, it is a necessity since it is a means of generating new knowledge which the business needs for improving business performance. As such, knowledge sharing theory is linked to the concept of cost (von Krogh et al., 2001; Hansen, 2002), diffusion (Rogers, 2003), communication process (Beesley and Cooper, 2008) and relationships (Carlsson, 2003). There are various circumstances under which knowledge sharing may occur and therefore knowledge sharing processes can be viewed from most tacit through social interaction at low cost and low shared information to most explicit at high cost and high shared information (Figure 2-4).

Figure 2-7 Cost Framework of Knowledge Creation Strategies

Source: Adapted from Nonaka and Toyama (2003); Cost and Diffusion (this author)



2.4.2.3 Social Processes

Tacit knowledge sharing is a natural social process (Yang and Farn, 2009). Based on an individual's behaviour to hoard his/her tacit knowledge, a fact noted previously by Pena (2002), Yang and Farn (2009) wanted to find out more about intention and behaviour to share tacit knowledge, though their work is intra-organisational based, it is useful as far as it examined factors that influenced tacit knowledge sharing intention and behaviour and also whether knowledge sharing intention lead to tacit knowledge sharing behaviour.

Their main findings were firstly that factors affecting intention to share tacit knowledge are affect-based trust, shared values and control (affect-based trust develops through relational ties, shared value develops based on a common understanding between individuals and internal control is based on self efficacy) (Yang and Farn, 2009). Secondly, tacit knowledge sharing intention does not necessarily result in tacit knowledge sharing behaviour, the reason for this being that external control moderated the relationship between tacit knowledge sharing intention and behaviour (external control is based on opportunities to share and prior experiences for sharing tacit knowledge). As a result, people did not share their tacit knowledge when there were no opportunities to share and had no prior experience of sharing tacit knowledge.

2.4.3 The Benefits of Knowledge Sharing

The form of shared information, tacit or explicit, is important since different knowledge brings different benefits or resource savings, based on the type of knowledge shared (Haas and Hansen, 2007). Sharing explicit knowledge in the form of electronic documents saves time but does not necessarily improve work quality (Haas and Hansen, 2007). On the other hand, sharing knowledge in the form of advice improves work quality but does not necessarily save time (Haas and Hansen, 2007). As a result, different forms of knowledge, one that is tacit-based (face to face conversation) and one that is explicit-based (documents) cannot be substituted one for the other. Such findings confirm the productive output of a knowledge sharing environment (Hansen, 2002; Haas and Hansen, 2007).

Applying tacit knowledge will result in organisational innovation, improved performance, and render the organisation more competitive (Grant, 1996). As argued by Prusak, the only thing that gives an organisation sustainable competitive advantage is *"what it knows, how it uses what it knows and how fast it can know something new"* (Prusak, 1996:8). The question is how may business people ***position*** themselves to achieve this? The answer relates to the capability of obtaining tacit and/or explicit knowledge. As stated before tacit knowledge can be embedded in the interactions of people, tools and tasks (Argote and Ingram, 2000). If there is a case that tacit knowledge is embedded in the characteristics of people, tools and tasks then these characteristics are the mechanisms through which knowledge is shared. As a result, innovation and improved performance is facilitated through mechanisms of people, tools and tasks.

Tacit knowledge may be further enhanced by adding explicit knowledge (Bennett, 1998). Explicit knowledge may be developed through the application of advanced information technologies (e.g., the Internet, intranets, web browsers, data warehouses, data mining and software agents) to systematize, facilitate, and expedite firm-wide knowledge management (Alavi and Tiwana, 2003). Explicit knowledge is easier to share. An understanding of the creation of explicit knowledge will also guide inter-organisational knowledge sharing processes. The need to create explicit knowledge is linked to the fact that the information revolution is transforming organisations in a manner that can affect profitability (Porter, 1998).

In summary, the characteristics of shared knowledge are important. Such characteristics typify the capability to share knowledge. For instance, if certain types of information are more readily communicated than other types of information then the former is rather fluid. Related to the characteristics of shared knowledge are factors which influence knowledge sharing. For example, cost can influence whether an opportunity is created for knowledge sharing. There are benefits to be derived from shared knowledge and these benefits are linked to the type of knowledge shared. As such, if we are to examine knowledge sharing, the information content is a particularly important concept to understand.

2.5 Conclusion

Knowledge is needed for business success. This chapter has examined the characteristics, models of knowledge management and characteristics, elements and benefits of shared knowledge. In particular, by examining the dynamics of knowledge sharing, the means to manage tacit knowledge which is often 'hidden' within individuals can be understood. Tacit knowledge emerges when knowledge creation processes operate. Such knowledge creation processes are in fact facilitators of knowledge sharing. Facilitators of knowledge sharing include socials, meetings, new ideas and non-human networks. Knowledge is therefore obtained through these facilitators which are predominantly social interaction mechanisms. The elements of knowledge sharing, the business size, cost and social processes are also important since these moderate the level of shared knowledge. In view of these facilitators and elements, the social network can be used as a mechanism of knowledge sharing.

The next chapter examines the literature about social interaction mechanisms, also called social networks. Social networks of people are formed through business and personal processes and as such these networks can be examined to understand in particular knowledge sharing. Bodies of theories relating to social networks including social capital theory are reviewed. These theories explain the formation and operation of social networks.

CHAPTER 3 SOCIAL NETWORKS

3.1 Introduction

As discussed in the previous chapter, knowledge is shared through social networks and therefore this chapter takes the opportunity to review theories of social networks. The importance of studying social networks relates to the fact that networks exist everywhere and enterprises collaborate then compete (Thorelli, 1986). Social network theory posits that people are tied together in some kind of structure which is formed through the individual, the dyad (two individuals) and the triad (two individuals plus a third individual) (Wolff, 1950) which are the basic social structures used to describe relationships. Consequently we may argue that relationships between business people have a structural dimension, which is an overarching pattern, and a way of analysing where people fit within their group, which is a relational dimension. The structural and relational dimensions influence behaviour and behaviour is both an outcome of a person's attribute and also of the structure and relation of individuals and groups (Degenne and Forse, 1999).

Social network literature is based in the discipline of sociology, and the works of main authors such as Granovetter (1973), Friedkin (1982), Burt (1984), Degenne and Forse (1999), Monge and Contractor (2003) and Freeman (2004) are critically reviewed. The first section considers the characteristics of social networks including types, embeddedness, structural influences and innovation. The types of social networks are important to characterise the different reasons for social networking. Based on the reasons for social networking, business people become fixed within their social networks, carry out ongoing practices of social networking and obtain network resources and this is ***embeddedness, structural influence*** and ***innovation***.

The second section is a review of social network theory. A multi-theoretical framework for studying communication networks (Monge and Contractor, 2003) is built up towards creating a general social network theory. These theories are self and mutual interest; contagion, semantic and cognitive theories; exchange and dependency theories; homophily, physical proximity, electronic proximity, and social support theories; and co-evolution theory.

The third section reviews concepts which are used to apply social network theory. Based on the characteristics of embeddedness, structural influence and innovation, social networks can be examined using certain measures and are related to the body of social network theories. The measures of embeddedness comprise density, transitivity and clustering. The measures of structural influence comprise strength of tie, centrality and clique. The measures of innovation comprise structural holes and brokerage. Finally, the chapter is concluded with a review of main theories and concepts.

3.2 The Characteristics of Social Networks

Social networking is an important activity for entrepreneurs and managers (Birley, Cromie and Myers, 1991) in that a social network emerges as people search for resources to meet their needs. Liebowtiz's (2007:3) definition of a social network is *"a set of relationships between a group of 'actors' (the 'actors' could be individuals, departments, and so on) who usually have similar interests."* Based on their networking practices, business people are also called network agents. In order to explain the characteristics of social networks, this section examines the types of social networks, network embeddedness, structural influence and innovation. Embeddedness relates to the fixing of agents within network structures and is formed through the inter-connectedness of the network, the relationships of agents within the network's structure influence these agents and innovation is the ability of the network to utilise network resources to achieve outcomes.

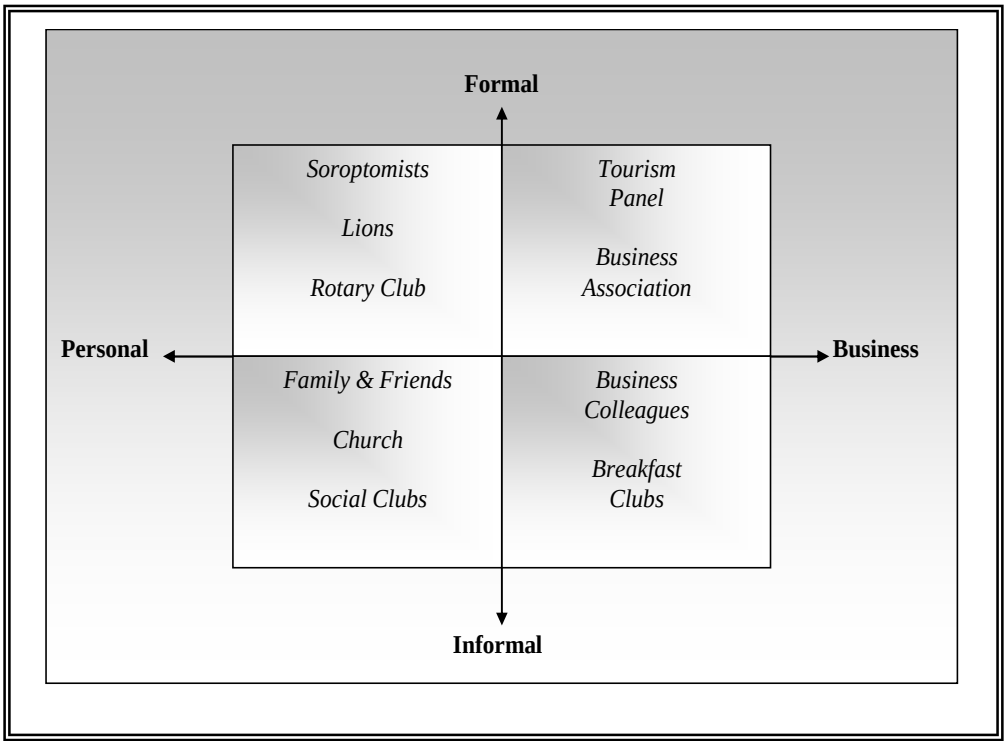
3.2.1 Types of Social Networks

Within social networks a distinction is made between two types of relationships: business and social. Some authors argue that a business relationship may form in addition to an existing social relationship (Birley et al., 1991; Moller and Wilson, 1995). A business relationship is based on common tasks, mutual interests and the achievement of goals (Marouf, 2007). On the other hand, a social relationship, which is viewed as a friendship, is defined as linkages based on emotional, non-instrumental relationships (Marouf, 2007). Business relationships can be based on mutuality (resource-dependent bonds between business people), long-term character (continuation and strength of relationships), process nature (dynamics of exchanges such as the content and means of communication) and context dependence (embeddedness of actions and outcomes) (Holmlund and Tornroos, 1997). A resource dependent relationship for example is one that the business has with a supplier while continuing strong relationships can be established through emotional bonds. The dynamics of exchanges include for instance, the type of information and tacit-based and explicit-based communication methods.

Social networks are established through formal and informal activities and engage in business and personal relationships and these are illustrated in respect of two axis: formal to informal; and personal to business (Figure 3-1). The term personal has been used to describe the opposing pole to business rather than social so as to not confuse the terms social and social networks. Each of the four quadrants is a type of social network. Named examples within each quadrant are for clarification purposes only and are not listed in any particular order neither are they an exhaustive list. A social network can be viewed as comprising a number of agents, who are often referred to as nodes, within the network. The relationships of these agents are based upon their ‘ties’ one with another and to assist in understanding social network theory it is helpful to recognise two types of tie. Firstly, ties that are business focused and, secondly those ties that are personal or friendship based.

Figure 3-1 Quadrant of Types of Social Network Relationships

Source: Author



Monge and Contractor (2003) argue that both formal and emergent networks can be identified and knowledge may be obtained through both of these social networking practices. Generally, a formal network is an imposed structure of relationships and an emergent network is a free flowing structure of relationships. Emergent networks come into being based on some pre-existing ongoing relationship whether for business or personal reasons. Seufert et al., (1999:184) stated, *"Intentional knowledge networks are seen as networks that are built up from scratch, whereas emergent knowledge networks already exist but have to be cultivated in order to become high-performing."* Whether the network is intentional or emergent, business people participate in social networks for both business and personal reasons.

3.2.2 Embeddedness

Fundamentally embeddedness means that network structures influence outcomes (Granovetter, 1985) and outcomes are determined by the resource exchanges. Resource exchanges can therefore be seen as being immersed in a social context (Gulati, 1998; Bengtsson and Kock, 1999; Rowley, 1997; Green and McNaughton, 2000; Borgatti and Foster, 2003; Kadushin, 2004). This is because as business people repeat the same resource exchanges their network ties become fixed and the network agent obtains a particular position. Embeddedness has been used to explain network influences, as to why agents gain networked resource advantages based on their position within the network (Kadushin, 2004). Resource exchanges occur based on certain conditions including: geographic region, proximity, clusters and strategic alliances. Business people therefore become embedded within these conditions and embeddedness has an almost pre-determined impact on the firm's ability to obtain and use resources, including knowledge.

3.2.2.1 Geographic Region

Social networks within a geographic region have been linked to knowledge resource exchanges. Anderson, Hakansson and Johanson (1994) assert that business relationships become embedded within a geographic region and therefore a firm's location may mean that it has an opportunity to become part of a dense network of other similar businesses (Rowley, 1997). Based on a dense network structure, the basic assumption is that knowledge exchange will occur (Powell et al., 1996; Osborn and Hagedoorn, 1997) since dense network structures facilitate diffusion of information. Density increases communication across the network and also diffuses norms across the network (Rowley, 1997). The characteristics of dense networks include shared expectations, ease of information exchange between stakeholders and potential for coalition formation (Rowley, 1997).

3.2.2.2 Proximity

Dense networks emerge from inter-firm linkages and may be the result of members being located in close proximity to one another (Akoorie, 2000) and within a geographic region businesses may be located within close proximity to other businesses. Proximity effects are important since outside the boundaries of firms, a complex web of relationships and resources influence the behaviour of these firms (Green and McNaughton, 2000). On one side, proximity has the positive effect of leveraging competencies and knowledge wherein business people can exchange resources and therefore contribute to endogenous growth and internationalisation (Green and McNaughton, 2000). On the other side, dense local networks can constrain innovation, by creating entry barriers to new entrants and the resources these new entrants may bring, and by reinforcing poor management practices (Green and McNaughton, 2000).

3.2.2.3 Clusters

Closely located businesses can be viewed as a cluster and it has been argued that network clusters create innovative environments for firms (Porter, 1998). A cluster is defined as, *"concentrations of interconnected companies and institutions in a particular field'* (Porter, 1998:78). Clusters therefore promote *"competition and co-operation"* (Porter, 1998:79). Clusters promote competition by increasing productivity, driving innovation and stimulating new businesses and clusters also promote co-operation by providing an environment for collaboration which is created as employees move from one organisation to the next inside the cluster (Porter, 1998). A cluster however has a high level of redundant information and each cluster is one source of information and therefore to benefit from the cluster an agent has to have relationships of non-redundant information with other agents within the cluster (Burt, 1992a). As a result, benefits from a cluster are not automatic and will depend on the characteristics of the ties an agent has within the cluster.

3.2.2.4 Strategic Alliances

Embeddedness affects the selection of organisations for strategic alliances (Gulati, 1998). Strategic alliances are *"voluntary arrangements between firms involving exchange, sharing, or co-development of products, technologies, or service"* (Gulati, 1998:293) and provide opportunities and constraints that influence the performance of businesses within the alliance (Gulati, 1998). By participating in a strategic alliance, social networks develop, and these networks provide opportunities and constraints based on their direct and indirect network connections. One motive for initiating a network connection is for some benefit to accrue (Kadushin, 2004) and so it is important that the quantity and quality of ties be carefully selected. The combination of network ties in turn influence the choice of a tie and thus the knowledge exchange possibilities (Spender, 1996a). Thus, through tie selection, structures are formed which result in the embeddedness of agents within the strategic alliance.

3.2.3 Structural Influence

Structural influence is created through the relationship of an agent within the network's structure and a network structure is formed through the interdependent links connecting the 'ego' and 'alters' (Parsons, 1951). The ego is the focal agent (node) of the network and is connected to the other agents (nodes) or 'alters' by ties (Borgatti and Foster, 2003). Nodes may be persons, teams and organisations which perform the network activity, which for example may be information sharing, whereas ties connect these nodes. Ties may be dichotomous, either present or absent, or valued. A tie's value is a reflection of the frequency of its use. For instance, if an agent contacts the same ego on four occasions the tie is valued as four (4). The combination of ego together with the associated alters, and the ties among these are called an ego-network (Hanneman and Riddle, 2005). Based on the inter-connectedness of the network, each ego has a particular relationship within the network's structure, which influences other egos and alters.

Network structure facilitates paths along which information, ideas and influence move between agents and therefore social network structure impacts economic outcomes (Granovetter, 2005) through certain characteristics including the strength of weak ties, centrality and cliques. This is because information that passes through networks is influenced by an agent's relationships within the network's structure (Powell et al., 1996). If an ego is frequently central within the network's structure then this centrally located ego will have timely access to new business opportunities and it is proposed that centrality in a network facilitates understanding, cooperation and enhances further exchange (Powell et al., 1996). Sparrow (2001) noted that centrality of a managing director and managers have been shown to impact upon the maintenance and development of capability in small firms. Structural influences are also evident based on the role of social networks on the performance of individuals and groups (Sparrowe, Liden, Wayne and Kraimer, 2001).

3.2.4 Innovation

Innovation is viewed as the use of knowledge to bring about performance benefits for businesses and this knowledge may be found in inter-organisational relationships (Powell et al., 1996). Collaboration and innovation work hand in hand and businesses often turn to collaboration to acquire new skills and resources as new knowledge can be acquired through repeated interaction between firms in a network (Kogut, 2000). Thus it is argued that social networking is the essence of innovation (Liebowitz, 2007) in that social networking activities produce networks of learning. *"When the sources of knowledge are disparate and the pathways of technological development uncharted, we would expect the emergence of networks of learning" (*Powell et al., 1996:143). In addition, other evidence suggests that centrality based on managerial ties and institutional ties enhance innovativeness (Bell, 2005).

There are however limits to innovative capability. Beeby and Booth (2000) noted that inter-dependent business relationships create dependency which results in limitations. Furthermore, there is no evidence to suggest, that networks result in innovation through learning new ways (Beeby and Booth, 2000). They pointed out that successful knowledge transfer is dependant upon a firm's technology and past, present and future experiences rather than the network (Beeby and Booth, 2000). On the other hand, Kogut (2000) noted that repeated interaction between firms in the network resulted in the emergence of a series of innovations. Repeated interactions result in the creation of structural holes (Burt, 1992b) and brokerage opportunities (Gould and Fernandez, 1989).

Moreover, business size can enhance innovation and build competitiveness and it has been shown that small business networks are important in enhancing competitiveness (Szarka, 1990; Perrow, 1992). There are certain other characteristics within small businesses which can enhance innovation. Small business networks produce trust, are centralised, reduce hierarchy, standardise the distribution of wealth and thereby reduce uneven development (Perrow, 1992). These small business networks are therefore more accessible for collaborative purposes and are arguably more innovative.

3.3 Social Network Theory

This section about social network theory examines the inter-relatedness of groups of theories and their relevance to studying social networks. Social network theory involves the study of social structures to understand their emergence and function and a contiguous social network theory is still emerging. To date much of the development in the subject area surrounds the methodology of analysing social networks. Monge and Contractor (2003) have reviewed theories which explain the formation and function of communication networks (Figure 3-2). These theories are self and mutual interest; contagion, semantic and cognitive theories; exchange and dependency theories; homophily, physical proximity, electronic proximity, and social support theories; and co-evolutionary theory.

Figure 3-2 Theories Relating to Social Networks

Source: Monge and Contractor (2003)

GROUPS OF THEORIES	**RELATED THEORIES AND CONCEPTS**
Self Interest	Social Capital Theory; Transaction Costs Theory
Mutual Self Interest	Public Good Theory; Critical Mass Theory
Cognitive	Cognitive Consistency Theory; Cognitive Dissonance Theory
Contagion	Social Learning Theory; Structural Theory of Action
Exchange and Dependency	Social Exchange Theory; Resource Dependency Theory
Homophily, Social Support and Proximity	Social Comparison Theory; Social Identity Theory; Physical and Electronic Proximity Concepts
Co-evolution	Organisational Ecology; Complexity Theory

A multi-theoretical, multi-level framework for understanding communication networks has been developed through integrating these theories (Monge and Contractor, 2003). There are several reasons for the Monge and Contractor's (2003) approach. First, the majority of previous network research was 'atheoretical.' Second most scholars approached network research from a single-level perspective. Third, focus was given on the structural properties of networks rather than more complex properties such as the attributes of nodes. Fourth, most network research used descriptive rather than inferential statistics. Thus, research about social networks needs further development in terms of theoretical, methodological and analytical approaches.

3.3.1 Self and Mutual Interest Theories

Self and mutual interest theories are based on action where persons seek their best interest or that of the group. Contractor and Monge (2002) defined self-interest as choices people make to favour their personal preferences and desires as they seek to achieve goals. Mutual interest means that choices are made to achieve mutual goals.

3.3.1.1 Self Interest

An actor's self-interest is the reason for network connections. Self-interest concepts were used to develop Coleman's social capital theory (Coleman, 1988) and Burt's 'structural hole' theory (Burt, 1992b). Social capital and 'structural hole' concepts are examined to explain how network connections provide benefit. Benefit is provided at a cost and so self-interest is based on transaction cost and therefore the concept of transaction cost has been used as a basis for a theory of social networks (Blois, 1990).

3.3.1.1.1 Social Capital Theory

Information resources obtained through social networking may be viewed as a form of social capital, hence, the reason for the inter-connectedness of social capital and social network theories. Social capital is a resource provided through relationships (Burt, 1992a) and basically, social capital is a resource provided from one actor to another as a gift (Choi and Hilton, 2005) and may be provided in several ways (Coleman, 1988). The first is obligations and expectations which depend on trust and the second is information channels (Coleman, 1988). Information is provided through social relations. Norms and effective sanctions are the third form of social capital (Coleman, 1998). These norms and effective sanctions may either facilitate or constrain action.

Social capital has value which can be quantified. Four separately accessed portions of social capital have been quantified: prestige and education related social capital, political and financial skills social capital, personal skills social capital and personal support social capital (van Der Gaag and Snijders, 2005). Within their study van Der Gaag and Snijders (2005) used a resource generator instrument to quantify social capital and respondents were asked about the access and availability of resources. An overarching finding was that access to social capital was positively correlated with access to all personal resources. There is however another side of social capital in that there can also be negative consequences. Social ties increase vulnerability to fraud when trust is placed in social relationships (Baker and Faulkner, 2004). Baker and Faulkner's (2004) findings were based on empirical evidence, which showed that investors who fail to conduct due diligence and do not use social ties had a 79% probability of loss of capital (financial). On the other hand, investors with pre-existing social ties and who do not conduct due diligence had a 39% probability of loss (Baker and Faulkner, 2004).

3.3.1.1.2 Transaction Costs Theory

The level of transaction cost may influence self interest. Transaction costs are incurred during the exchange of goods and services (Williamson, 1979) and the concept of transaction cost has been used to explain how networks can become economically efficient (Jarillo, 1988). *"In the absence of transaction costs firms would not integrate functions"* (Jarillo, 1988:33). The reverse is true; businesses integrate because there are transaction costs and therefore by sharing transaction costs, businesses become more efficient (Jarillo, 1988). Transaction costs can therefore influence if a business person may enter into exchange relationships.

3.3.1.2 Mutual Interest

Mutual interest means that network connections are made to achieve some collective good. Collective goods are viewed as resources that benefit the group as a whole as well as the individual. Two theories are used to explain mutual interest: public good theory (Samuelson, 1954) and critical mass theory (Marwell and Oliver, 1993).

3.3.1.2.1 Public Good Theory

The theory of public goods states that a public good is one that if consumed by one individual, does not subtract from another individual's consumption of the good (Samuelson, 1954). As a result, there is collective consumption of the good. Goldin (1977) disagrees and suggests that goods are not public in the sense that access is unequal but rather access is selective. Selective access means that some resources become unavailable and therefore mutual interest is not achieved. Consequently, even though social networks may be sources of collective goods, networks may not function as such if network connections result in selective access to these goods.

3.3.1.2.2 Critical Mass Theory

Critical mass theory (Marwell and Oliver, 1993) suggests a minimum number of people are required to achieve collective action to obtain a collective good. Marwell and Oliver (1993) researched the 'critical mass', required using social network methods to examine structural processes of density, centralisation and cliques. They theorise that,

> *"For collective action to occur, the group must contain at least one organiser network with enough resourceful people that the sum of their contributions forms a viable contract. That same network must also have an organiser who can afford to contact enough people to form the contract"* (Marwell and Oliver, 1993:115).

Critical mass theory is relevant to understand how adoption processes work within the larger social context. A review of their work demonstrates that critical mass theory has been used to build models of adaptive learning, sanctioning systems and influence (Oliver and Marwell, 2001).

3.3.2 Cognitive Theories

Cognitive social structure has been studied by several social network theorists (Wasserman and Galaskiewicz, 1994; Moller and Wilson, 1995, Monge and Contractor, 2003 and Borgatti and Foster, 2003). Cognitive theories explain the formation of social networks by suggesting that networks are formed based on an individual's perception. Social networks can be formed through peoples' cognition of others and cognition includes responses such as like and dislike. Cognitive theories include: cognitive consistency theory and cognitive dissonance theory (Monge and Contractor, 2003). Cognitive consistency theory (Rosenberg, 1960) distinguishes between beliefs and feelings, constructs of attitudes, which affect an individual's behaviour while cognitive dissonance theory (Festinger, 1957) explains how people seek to reduce inconsistent beliefs.

3.3.2.1 Cognitive Consistency Theory

Cognitive consistency theory (Rosenberg, 1960:319) states that, *"if people seek congruence between their beliefs and feelings toward objects, then attitudes can be changed by modifying either the beliefs or feelings associated with them."* As a result, an individual's feeling about an object changes based on their beliefs or beliefs change to be congruent with feelings, thus achieving consistency. Based on the feeling (affective) and belief (cognitive) constructs, the cognitive consistency theory is also called affective-cognitive consistency theory. Affective-consistency theory has been operationalised to identify the least effort required to move an individual from attitude, belief and behavioural intention positions (Milne and Meier, 1976). Cognitive consistency theory can be used to explain how social networks drive consistency in peoples' attitudes and therefore pre-determine their network connections (Monge and Contractor, 2003).

3.3.2.2 Cognitive Dissonance Theory

Cognitive dissonance theory (Festinger, 1957) aims to explain how people perceptively adjust unresolved issues. This theory states that an individual seeks to reduce dissonance which is *"the existence of non-fitting relations among cognitions"* (Festinger, 1957:3). Dissonance may be triggered by new information. Dissonance is reduced by achieving psychological consonance or avoiding situations and information. A relevant example of reducing the level of cognitive dissonance occurs when an individual avoids new information (Choo, 1998) and therefore both consonance and avoidance may influence the formation of network connections between individuals.

3.3.3 Contagion Theories

Contagion theories explain the influence social networks have on the spread of attitudes and behaviour (Monge and Contractor, 2003) and these theories relate to exchange and dependency. Two contagion theories are social learning (Mischel, 1968) and structural theory of action (Burt, 1982).

3.3.3.1 Social Learning Theory

Social learning theory (Mischel, 1968) suggests that behaviour is adapted based on past experiences. Certain cognitive and learning conditions stimulate present behaviour (Mishel, 1968). Principles of social learning include observation, contiguous associations and distinction between acquisition and performance of what is learnt. Social learning takes place as a result of stimuli from the external environment. *"The central idea of social learning theory is that one individual learns from another by means of observational modelling"* (Rogers, 2003:342). Patterns of behaviour are observed through verbal and non-verbal clues and thus, social learning drives the diffusion processes (Rogers, 2003).

3.3.3.2 Structural Theory of Action

A structural theory of action (Burt, 1982) suggests that network structure affects the performance of roles based on relational and positional approaches to action. A relational approach describes the relationship between pairs of agents whereas a positional approach describes the pattern of relationships within a system of agents (Burt, 1980). The former is a network clique while the latter is a jointly occupied network position. *"A clique is a set of actors in a network who are connected to one another by strong relations"* (Burt, 1980:97). *"A jointly occupied network position is a set of structurally equivalent actors"* (Burt, 1980:100). Structural equivalence means that an agent has similar relationships as other agents and therefore both the focal agent and these other agents perform the same role and therefore action is the result of the network's structure.

3.3.4 Exchange and Dependency Theories

Businesses become more inter-dependent and have long-term relationships that will benefit the business. Exchange and dependency theories explain how social networks are forged through the need to obtain information and material resources. An exchange relationship becomes dependent when persons have limited access to resources (Buttery and Buttery, 1994; Moller and Wilson, 1995; Monge and Contractor, 2003). If an agent expands their network of agents, the focal agent is able to broker the dependent relationship and therefore become less dependent on a few sources of information (Monge and Contractor, 2003). Dependency on a particular agent is reduced creating an improvement in the power balance. The main exchange and dependency theories are social exchange theory (Homans, 1958; Emerson, 1962; Blau, 1964),) and resource dependency theory (Ulrich and Barney, 1984).

3.3.4.1 Social Exchange Theory

There are three main social exchange theorists, Homans (1958), Emerson (1962) and Blau (1964). An exchange relationship is a form of social behaviour which is facilitated through cohesiveness, communication or interaction and norms (Homans, 1958). *"Social behaviour is an exchange of goods, material goods but also non-material ones, such as the symbols of approval or prestige"* (Homans, 1958:606). He noted that individual behaviour forms a social structure which arises from processes of exchange between members and exchanges have costs and values which in turn balance the exchange. Exchanges are also power-dependent. *"Persons that give much to others try to get much from them, and persons that get much from others are under pressure to give much to them"* (Homans, 1958:606).

Power-dependent relationships were theorised by Emerson (1962). Power is not an attribute of a person but an outcome of a social relationship (Emerson, 1962). It is also noted that power relationships (a relationship where A dominates B but not C) are not passed on from one person to another. Dependence and power are two sides of the same coin. The power of A over B *(Pab)* is based on the dependence of B on A *(Dba)* and therefore *Pab=Dba* (Emerson, 1962). Dependence is based on motivational interest in the exchange relationship and power is based on resistance to dependence (Emerson, 1962). Hence the two concepts of dependence and power work hand in hand in the performance of an exchange relationship. The main point is that if the relationship is one of power an exchange may occur, but if the relationship is one of dependence an exchange will occur.

Blau (1964:89 & 90) proposed the distinctive meaning of social exchange, which involves,

> *"An individual who supplies rewarding services to another obligates him. To discharge this obligation, the second must furnish benefits to the first in turn. … If both individuals value what they receive from the other, both are prone to supply more of their own services to provide incentives for the other to increase his supply and to avoid becoming indebted to him. As both receive increasing amounts of assistance they originally needed rather badly, however, their need for still further assistance typically declines."*

In theory, social exchange is involved in human interaction. Interaction is viewed as a complex exchange process (Moller and Wilson, 1995). Network agents have social exchange relations (Hakansson & Johanson, 1993) and exchange resources based on reciprocity (Blau, 1964; Choi & Hilton, 2005). Knowledge is shared as a means of social exchange based on feelings to reciprocate rather than any specific reward to be obtained (Bock and Kim, 2002). According to Bock and Kim (2002), social exchange entails unspecified obligations which engender feelings of personal obligation, gratitude and trust.

3.3.4.2 Resource Dependency Theory

Resource dependency theory explains why business people rely on each other. A resource dependence view of business operation means that businesses alter their behaviour to acquire and maintain resources and the main assumptions are internal and external features of businesses, scarce resources and leveraging power-dependent relationships between businesses (Ulrich and Barney, 1984). Based on these assumptions, businesses seek to control the acquisition of scarce resources and limit their dependence on other businesses for scarce resources. In order to leverage resource dependency businesses can adopt several strategies: de-link internal and external features of the business, re-locate to an area where resources are less scarce and balance power-dependent relationships by increasing its networking activities (Ulrich and Barney, 1984). Thus, controlling resource dependency is rooted in business strategy (Medcof, 2001).

3.3.5 Homophily and Social Support Theories and Proximity Concepts

Homophily relates to persons networking with persons to which they are similar to (Degenne and Forse, 1999; Rogers, 2003; Skvoretz et al., 2004). The most common characteristics, according to Monge and Contractor (2003) are gender, age, race, religion, product or service sector or membership. The desire for social support may arguably be a reason for the formation of a communication relationship. For instance being embedded in dense networks will provide actors with resources and social support to cope with day to day business life (Monge and Contractor, 2003). Physical proximity influences the probability of a network of agents being formed. Electronic proximity relates to familiarity and use of modern technology as a communication mechanism. Main theories of the homophily, social support and proximity group of theories include social comparison theory (Turner, 1975), social identity theory (Ashforth and Mael, 1989), physical and electronic propinquity (Walther and Bazarova, 2008).

3.3.5.1 Social Comparison Theory

Social comparison theory explains the dynamics between in-group and out-group interaction. A social comparison is a process by which one individual competes with another to achieve a certain 'social' status. That is to move from the out-group to the in-group. *"Social comparisons give rise to processes of mutual differentiation between groups which can be analysed as a form of 'social' competition"* (Turner, 1975:5). There are four main assumptions: (1) the individual has knowledge of her/his group; (2) the individual will tend to remain a member of a group and seek membership of new groups; (3) all groups exist in the midst of other groups; and (4) a group will be capable of preserving its contribution to those aspects of an individual's social identity which are positively valued (Turner, 1975). Comparison involves three activities: (1) self-categorisation; (2) identifying the dimensions of comparison; and (3) values associated with a particular comparison (Turner, 1975).

3.3.5.2 Social Identity Theory

Social identity theory explains the categorisation of individuals based on their characteristics (Ashforth and Mael, 1989). Characteristics include symbols of prestige, status and reputation and as a result, an individual locates herself/himself within the social environment (Ashforth and Mael, 1989). Social identification means that the individual is also associated with a group which has the same attitudes and values. Individuals who have the same social identity will communicate or interact with each other thereby promulgating those similar attitudes and values. Self-categorisation theory is linked to social identity theory and specifies the cognitive processes that form the basis of distinguishing between the in-group and out-group (Hogg and Terry, 2000). Accordingly, based on self-identification and categorisation, individuals behave in a manner that is typical of the group to which they ascribe to.

3.3.5.3 Physical and Electronic Proximity Concepts

"Physical propinquity means nearness to another person and is associated with the opportunity to converse and a psychological feeling of involvement with others" (Walther and Bazarova, 2008:624). Empirical research on proximity suggests that ties are formed and maintained when persons are closer to one another (Stokowski, 1994; Akoorie, 2000; Green and McNaughton, 2000; McNaughton, 2000; Oerlemans, Meeus and Boekema, 2000; Rogers, 2003). Physical proximity affects group formation and in turn the interaction and affective behaviour of members of the group (Borgatti and Foster, 2003). Physical proximity makes it easier to interact (Hansen, 2002) and as a result through interaction ties are formed. Ongoing physical proximity therefore results in reinforcement of ties and provides an environment for sustaining ties.

Electronic proximity involves the ability to communicate through electronic media, such as blogs and electronic forum, which influences the formation of network ties (Monge and Contractor, 2003; Awad and Ghaziri, 2004; Liebowitz, 2007). The type of electronic media influences electronic proximity and is explained by the theory of electronic propinquity. The theory of electronic propinquity seeks to explain and predict the consequences of using alternative media (Walther and Bazarova, 2008). This theory suggests that individuals feel a sense of nearness when one communication channel is used as compared with another (Walther and Bazarova, 2008). Factors that increase electronic propinquity include: *"bandwidth of the communication medium, the capacity of the communication channel for mutual directionality and the communication skills of the individual communicators"* (Walther and Bazarova, 2008:624). Walther and Bazarova (2008) note that electronic propinquity decreases when the information is complex, there are perceived communication rules and the perceived number of communication channels. As a result, certain types of information, for example one that is more technical may be suitable to be communicated using a certain communication channel as compared with another communication channel.

3.3.6 Co-evolution Theories

Network evolution theories explain how networks acquire resources through interaction with each other (Easton, Wilkinson and Georgieva, 1997; Osborn and Hagedoorn, 1997; Monge and Contractor, 2003). According to Monge and Contractor (2003) networks evolve based on commensality and symbiosis (biological terms). Commensalistic action ranges from mutualism to competition while symbiosis is based on functional differences relating to the supply chain as for example, a tourism organisation providing marketing services for an hotelier.

In terms of inter-organisational relationships of information sharing commensalistic actions relate to sharing information to improve business performance on the mutualism end of the scale. On the competition end of the scale, information is not shared. Theories can be used to explain both commensalistic action and symbiosis, which control the network's circumstances and thus maintain and grow the network. Two main theories which explain co-evolution are organisational ecology theory (Carroll, 1984) and complexity theory (Schneider and Somers, 2006).

3.3.6.1 Organisational Ecology Theory

Organisational ecology theory explains how organisations grow and develop (Carroll, 1984). Approaches to organisational ecology include: development, selection and macro-evolutionary. Carroll (1984) explains that the development approach states that organisations adapt in response to internal and external stimuli, while the selection approach suggests that organisations are eliminated or selected to survive and the macro-evolutionary approach examines communities of organisations, for instance industrial districts, to determine patterns of new organisational forms. Organisations may grow and develop based on one or more of these approaches. There is still need to clarify how environmental changes affect organisations and hence the reason for a review of complexity theory.

3.3.6.2 Complexity Theory

It is proposed by Schneider and Somers (2006) that complexity theory has three building blocks: non-linear dynamics, chaos theory and adaptation and evolution. Non-linear dynamics mean that there are different responses to the same external stimuli. For instance, a butterfly effect happens when a large disproportionate change is a result of an external stimulus. As a result, complexity theory proposes that change to the system is not always in proportion to the given external stimuli. Chaos theory suggests that change dynamics are not random and that there is some attractor which brings about the change. Adaptation and evolution mean that a complex system changes based on exposure to certain stimuli. Schneider and Somers (2006:355) note,

> *"Highly chaotic systems cannot maintain their behaviours, as small forces can result in systems disruption, i.e. the butterfly effect. … With optimal levels of chaos and anti-chaos/order, a system will then be poised, and hence, potentially adaptive and capable of evolution."*

Co-evolution can be explained using complexity theory since within a network, the agent's exposure to an external stimulus is not random but determined by the network's structure and the degree of adaptation and co-evolution determined by both the attribute traits and relational dynamics of that connection.

In summary, social network theory is built by using a multi-theoretical framework. Such a framework considers the broad context within which social networks emerge and function. Theories of emergence include interest, cognitive, homophily, social support and proximity theories, while theories of function include contagion, exchange and dependency and co-evolution theories. These theories can be used to explain the characteristics of social networks, for example the types of social networks (self-interest), how agents become enabled or constrained within networks (power-dependent relationships) and adoption of certain business practices (social learning theory). The next section reviews how social network theory is applied. The review has been categorised based on certain characteristics of social networks: embeddedness, structural influence and innovation.

3.4 Social Network Theory Application

This section integrates the main characteristics of social networks, embeddedness, structural influence and innovation (Sub-section 3.2) with social network related theories (Sub-section 3.3). Social network analysts are engaged in mapping patterns formed through interaction of social agents. Basically social network theory is the study of these network patterns and explains how network patterns operate. To formulate social network theory, network patterns may be studied from three perspectives: the overall network, the relationships within the network's structure and the outcomes of the network's structure. Consequently, social network theory is applied using the categories of: (1) embeddedness (overall network position perspective); (2) structural influence (agent relational perspective); and (3) innovation (outcome of network structure). Each of these characteristics is linked to a group of theories which can be used to explain the emerging network pattern.

3.4.1 Embeddedness

Embeddedness means that the overall network structure enables or constrains agents within that structure. Density, transitivity and clustering are three measures which can be used to study the level of embeddedness within the network's structure and three groups of theories can be used to explain the characteristic of embeddedness. Exchange and dependency theories can be used to explain the level of density within the network. The level of transitivity determines contagion effects and therefore, social learning theory provides an explanation of the level of transitivity within the network's structure. Network clusters are formed through mutual interest and therefore public good and critical mass theories can be used to understand the level of network clustering.

3.4.1.1 Density

Density is a means of describing one embedded characteristic of social structures (Wasserman and Faust, 1994; Moller and Wilson, 1995). Connectivity relates to the number of network dyads (two connected agents) and triads (dyad plus one connected agent) and these connections are formed through exchange and dependent relationships between agents. Therefore the exchange of resources is based on cohesiveness of social behaviour and resource dependency. Birley et al. (1991) viewed a personal dense network as one in which all the individuals in the personal network of an entrepreneur have contact with one another. These contacts are forged through power-dependent relationships of dyadic connections for a group of agents defined within a particular boundary and thus the measure of density has been applied to understand network dynamics. Burt (1992a) argued that high density is an indication of increasing competition for available resources. As a result, denser networks mean that there are more exchanges based on resource dependency.

3.4.1.2 Transitivity

Transitivity measures the number of sharing triads within the network's structure (Figure 6-9). Wasserman and Faust (1994) defined a triad as three agents and their ties. The importance of studying the triad relates to the fact that according to Degenne and Forse (1999) triads often catalyse and therefore transitivity is an indication of the network's strength in terms of resource sharing. For instance, even though A and C are not directly connected, if they are connected through B there is transitivity between A and C which strengthens the network. Since triads catalyse network resources, social learning theory can be used to explain the transitive effects within the network's structure. Social learning theory (Mischel, 1968) involves learning from each other and therefore the operation of social learning can be used to explain the existence of transitive connections within the network as A learns from B and B learns from C and therefore A learns from C.

3.4.1.3 Clustering

Clusters are contiguous groups of connected nodes (agents). A cluster is a group of nodes within a short geodesic distance (the length of the shortest path between two nodes on a graph). According to Hanneman & Riddle (2005), two agents are joined in a cluster when they both have similar patterns of ties. Clusters are identified not based on points that are equally 'close' to one another but rather there is contiguity in the graph and there is a clear separation from other clusters (Scott, 2000). Thus, a cluster can be viewed as a critical mass within the network's structure. This critical mass emerges as agents within the network access the same resources from other agents and each other. These resources are therefore public goods, which are consumed collectively. In view of this, the extent of network clustering is a measure of the mutual interest of the agents within the cluster and therefore public good theory (Samuelson, 1954) and critical mass theory (Marwell and Oliver, 1993) can be used to explain the operation of network clusters.

3.4.2 Structural Influence

Structural influences are based on the relationships of an agent within the network's structure. The inter-connections of agents within the network create advantages for some agents and disadvantages for other agents. The strength of ties, centrality and cliques are indications of the level of structural influence within the network's structure and certain theories can be used to explain these characteristics. Homophily and proximity theories explain the strength of network ties. In theory, centrality levels are based on cognitive perspectives of network agents, in particular their cognitive consistency (Rosenberg, 1960) and cliques can be explained by the structural theory of action (Burt, 1982).

3.4.2.1 Strength of Ties

A ground-breaking network analysis paper, which has resulted in much empirical work is Granovetter's 'strength of weak ties' (Granovetter, 1973). Stronger ties, those are ties between individuals who meet frequently, can provide knowledge resources. Dissemination of information through stronger ties however, results in inertia since everyone in the social network will know the same information. A weak tie is a bridge between two agents that have less frequency of contact (Granovetter, 1973). Weak ties are more important in providing resource benefits to the network, and by having more weak ties, an agent is in a better network relationship (Granovetter, 1973). The major tenet of Granovetter's argument is that the removal of the average weak tie will do more damage to transmission possibilities in comparison to the removal of the average strong tie. In other words more people can be reached through weak ties. Granovetter's ideas are partially supported by Friedkin (1982) who argued that strong ties are more important than weak ties in promoting information flow within an organisation and the reverse is true for information flow outside of the organisation.

The strength of ties argument is very important to explain the influence of agents within the network. Ties are formed based on homophily and proximity theories and therefore, these theories can be used to understand the emergence of strong and weak ties within the network's structure. Based on social comparison theory, agents with similar traits, which form an in-group, will network with each other and have stronger ties. Those agents in the out-group will emerge as weak ties. In addition, agents will form stronger ties with other similar agents, which they identify with. Similarly, proximity increases the likelihood of the frequency of a tie (Monge and Contractor, 2003) and therefore proximity, whether physical or electronic, influences group behaviour (Borgatti and Foster, 2003). In view of this, the size of an agent's network is the extent of an agent's influence across the network and this size can be explained based on homophily and proximity theories.

3.4.2.2 Centrality

Centrality is a structural feature which influences information flow (Rowley, 1997). This is because centrality relates to the relationship of an individual or organisation as compared to another organisation with which it is connected (Wasserman and Faust, 1994; Wasserman and Galaskiewicz, 1994; Rowley, 1997). Central agents are therefore potential brokers, who are capable of sharing information and therefore measures of centrality indicate the level of influence agents have in their networks. As a result, an agent's power in the network may be defined based on the degree, closeness and betweenness centrality measures. Centrality indicates that the focal agent is in a more advantageous relationship to obtain resources from the network. This is because other agents within the network's structure sought to obtain resources from this focal agent and thereby centralising the focal agent. The focal agent now has the capability to capitalise from its connections with other agents.

Centrality improves an agent's ability to obtain resources and this concept can be explained using theories of cognitive consistency and cognitive dissonance. For example, agents seek resources from focal agents that are consistent with their attitudes and beliefs and therefore their cognition of these focal agents result in the formation of network ties. On the other hand, agents will increase dissonance by dissociating themselves from focal agents who they perceive are not similar in attitudes and beliefs. In theory, both cognitive consistency and cognitive dissonance work hand in hand to centralise certain focal agents as compared with other agents in the network's structure.

3.4.2.3 Cliques

Groups are cliques which may be viewed as macro-structures within the network (Hanneman and Riddle, 2005). Strong ties in well defined groups are cliques (Granovetter, 1973) and hence clique formation is also linked to theories of homophily and proximity. Weak ties bridge two cliques and affect the diffusion capability of the network (Rogers, 2003). As such a clique forms when the maximum numbers of agents have all possible ties present between themselves (Hanneman and Riddle, 2005). Cliques therefore enhance the cohesiveness of the network (Liebowitz, 2007) through the bridging of network agents. An understanding of the nature of the group or sub-group, which is the inter-relationships of the group members, is important to understand the coherence of the roles played by group members. Thus, clique membership relates to the performance of a role and these roles influence resources available to other agents within the network's structure. Thus the formation of cliques within a network can be explained by the structural theory of action (Burt, 1982).

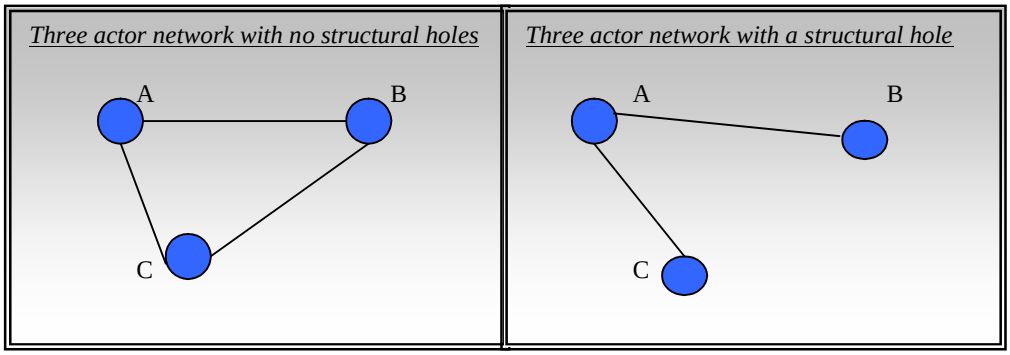
3.4.3 Innovation

Innovation is the ability of the network to apply knowledge based on structural holes and brokerage roles. Innovation is therefore an outcome of the network's structure. Knowledge resources are needed to innovate and are a form of social capital. Social capital is about the value of connections (Borgatti and Foster, 2003) and connections either direct or indirect determine the flow of network resources. In view of this, obtaining social capital through the network depends on (1) the level of structural holes; and (2) the number and type of brokerage roles.

3.4.3.1 Structural Holes

Figure 3-3 Structural Hole Diagrams

Source: Hanneman and Riddle (2005)



Structural holes provide a strategic advantage since individuals in structural holes have ties (weak ones) into multiple networks that are largely separated from one another (Burt, 1992b). As such, structural holes are connections between non-redundant contacts (Burt, 1992b). As shown in Figure 3-3 above, the diagram on the right shows a structural hole since B is not connected to C their information sources are in theory different (non-redundant) and therefore A will theoretically receive different information from both B and C. Whereas the diagram on the left shows no structural holes and all three agents A, B, and C have potentially redundant information flowing between them. Structural hole theory (Burt, 1992b) explains outcomes of being unconnected in a network of social agents. A structural hole provides an information advantage since the separation between non-redundant contacts, means that these contacts are in turn otherwise connected in the network and therefore have other potential sources of information. In theory, structural holes provide beneficial social capital.

3.4.3.2 Brokerage

Structural hole theory, weak ties and brokerage roles are inter-related. A structural hole between two contacts provides network benefits that are additive rather than overlapping (Burt, 1992b). This is because structural holes are created through weak ties. Granovetter's (1973) strength of weak ties theory relates to Burt's (1992b) structural hole theory. People who have weak ties are likely to be in structural holes, which allow them to be more efficient in obtaining information since based on Granovetter's weak tie theory, weak ties provide non-redundant information. When structural holes are filled the network agent acts as a broker providing network resources (Burt, 1997). This is because structural holes provide brokerage opportunities in the network (Burt, 1992; Kadushin, 2004) since a broker, bridging the structural hole, has the capability to share the social capital between groups. As a result, senior managers' with exclusive exchange relations (structural holes) to disconnected partners (weak ties) earn higher profits (brokerage) (Burt, 1997a). Specific brokerage roles are explained in the methodology chapter (Figure 6-9).

3.5 Conclusion

This chapter reviewed social network characteristics, social network theory and application. The interactions that people have form a social network pattern which may be studied as a social structure. Social structure is formed through inter-dependent network ties. Particular aspects of social structure which may be studied include embeddedness, structural influence and innovation. A body of theories relating to social networks were reviewed to understand how networks are formed and maintained. These theories were reviewed and applied to understand social network characteristics. Inter-organisational relationships are formed based on a body of social network related theories and these theories in-turn explain the embeddedness, structural influence and innovative capability of inter-organisational networks.

The next chapter will critically discuss the reasons for inter-organisational knowledge sharing. The systemic features of inter-organisational knowledge sharing activities are explained using systems, social systems and structuration theories. An understanding of reasons for social networking and knowledge sharing in the tourism sector is needed since there is an existing gap about applications of knowledge management principles within the tourism sector. Particularly, there are no known examples of empirical evidence of information sharing within a social network and inter-organisational context for the tourism sector (Cooper, 2006). The chapter then proposes to examine the facilitating conditions of inter-organisational knowledge sharing which are then used to consider two knowledge sharing systems.

CHAPTER 4 INTER-ORGANISATIONAL KNOWLEDGE SHARING

4.1 Introduction

A theoretical basis for analysing and understanding inter-organisational knowledge sharing can be formulated by combining concepts and theories from knowledge management and social networks literature. These concepts and theories provide a theoretical foundation that is built upon the premise that social networking activities facilitate knowledge sharing practices through what may be termed an inter-organisational knowledge sharing system. Such a system may exist within an organisation and between organisations.

The focus of this research is inter-organisational knowledge sharing practices. These practices have been examined through concepts and theories relating to systems, social systems and structuration, which this chapter seeks to identify and discuss. This chapter has two sections covering social science theories and inter-organisational knowledge sharing. The final section concludes how and why social networking facilitates inter-organisational knowledge sharing.

4.2 Social Science Theories

Social science theories seek to explain the motives and behaviour of people. One such behaviour is knowledge sharing. Knowledge may be shared through inter-organisational networks of business people and takes place as a result of certain factors and structures that exist which can be explained through certain concepts and theories. The theories discussed in this section relate to: systems, social systems and structuration which between them provide an explanation for the occurrence of knowledge sharing through inter-organisational networks.

4.2.1 Systems Theories

Facets of systems theory have been linked to organisational theory to understand the operation of an organisation (Kast and Rosenzwig, 1975). A system may be described as having several interacting components: inputs, flows, processes, and outputs, from which the interaction of these components forms the system. A system may also be described based on its systemic features which are the consequences or outcomes of a system. As a result, to fully examine an inter-organisational knowledge sharing system there is need to recognise two levels of analysis: (1) the components, which are the agents, knowledge sharing processes and outputs; and (2) the features, which are the relational exchanges within the network (Spender, 1996). Relational exchanges occur between system components and form certain patterns (Wortman and Luthans, 1975; Moller and Wilson, 1995). These patterns are invisible and therefore a system is bound together by invisible patterns which play out within a time period (Senge, 2006).

In view of this, systems theory can provide an overarching framework for understanding the operation of social networks and has been used to explain the formation of network organisations (Palmer, 1996). Three branches of systems theory exist: structural-functionalism, cybernetics and general systems theory (Monge and Contractor, 2003).

First, the structural-functionalist perspective may be viewed as the traditional perspective comprising of identified components which must be ordered to show how the system works. The main advantage of the functionalist view is that the parts, inter-relationships and outcomes of the system are identified. On the other hand, structural functionalism does not necessarily explain how the system grows and adjusts (Monge and Contractor, 2003).

Second, a cybernetic perspective identifies the system and its environment, selects a controlling attribute of that system, allows this controlling attribute to influence the system and then monitors the system. This type of system perspective has been criticised as being too control oriented and allowing little flexibility in terms of studying several dynamics at once.

Third, a general systems perspective identifies the inter-dependent relationships of the system (Schneider and Somers, 2006). The general theory of action systems can be used to explain the emergence and function of social structures (Parsons, 1951). System actions can be described as consistent patterns of integration which arise from situational and motivational elements (Parsons, 1951). Consistent patterns of integration suggest that social practices are repetitive and therefore form a structure (Nadel and Fortes, 1957). These structures respond to changes in the system. Thus, the focus of general systems theory is the systems' response to environmental changes which is similar to a complex adaptive system environment (CASE).

The identification of a complex adaptive system results from adopting a general systems perspective. A complex adaptive system is defined as *"complex systems where agents follow rules that explicitly and sometimes consciously seek to improve their fitness in terms of performance, adaptability, or survival"* (Monge and Contractor, 2003:87). A complex adaptive system framework further advances understanding of systems theory since it attempts to explain how the system adjusts itself based on certain attributes and relations within the system. These attributes and relations are those of business people and therefore a network of business people may be viewed as operating as a Complex Adaptive System (CAS) (Schneider and Somers, 2006).

4.2.2 Social Systems Theories

Social systems theories focus on the motivation and behaviour of people which result in the functioning of structures in society (Parsons, 1951). There is a paradox as to whether it is the motivational dynamics or the structural patterns that explain behaviour and this paradox has been called the Nadel's paradox (Nadel and Fortes, 1957). Motivation is a foundational concept in understanding why systems operate the way they do. People's motives are derived from their role-orientation, value-orientation and personality and the structural mechanisms of the social system (Parsons, 1951). These motivational dynamics account for the operation and sustainability of structural patterns (Parsons, 1951) and result in behaviour.

Structural patterns also influence behaviour. Social systems theories suggest that structural patterns are important to the understanding of the operation of a social system (Nadel and Fortes, 1957). Structural patterns are formed through dyadic (two agents) and triadic (dyad plus one agent) ties. These interactional ties also perform a particular role in the network pattern and each role has a behavioural attribute which can be the performance of a particular task. Thus, there is a question as to whether it is the attribute of the role or the structural pattern which drives the functioning of the system. This question, often referred to as Nadel's paradox (Nadel and Fortes, 1957) was re-visited by DiMaggio (1992) and it was suggested that behaviour cannot be purely structural and that there are cultural and subjective aspects of action. As such, although structural patterns influence behaviour, attributes are also important. Attributes of network agents are typifications that shape the evolution of structural patterns and as such attributes are used by people when deciding to start or maintain relationships (DiMaggio, 1992).

4.2.3 Structuration Theory

Structuration theory is based on an objectivist, naturalistic point of view that social systems can be analysed in ways similar to that adopted for biological systems (Giddens, 1984). The theory of structuration is based on the idea that social practices re-occur through time and space and are based on the reflexive action of knowledgeable agents. This reflexive action can be explained as a notion that human conduct has an unconscious motivation. A motive is a prompt to fulfil a want and reflexivity is the unconscious motive to act (Giddens, 1984). Within structuration theory people are considered to be role-taking, norm-forming beings who behave according to their perception of reality and thereby their social practices become structures (Nonaka and Toyama, 2003). However, there is also the aspect of agency which is founded on the premise that an individual has the power to act differently. Action is therefore conscious and not unconscious. The debate (Nadel and Fortes, 1957; DiMaggio, 1992) continues as to whether it is the structural patterns or agents' attributes that result in behaviours.

The core concepts of structuration theory are: structure, system and duality of structure. **Structure** means the patterning of social relations. Patterning is a network of connections and hence structuration theory is connected to social network analysis. A **system** is operated through rules and resources and rules set out routine practices that operate a system whereas resources are a form of social capital and a system is the result of these rules and resources. A 'systemness' of action is created through recursive ordering of social practices. For instance, a driver reflexively monitors his or her driving practices and as a result, a systemness of driving action happens. **Duality of structure** is created as agents and structures become both medium and outcome and the agents are the allocators of system resources while the structures are the patterns of relationships which directly or indirectly link social positions (Cohen, 1989). The result is a system of relations between agents which results in outcomes and these outcomes in turn influence agents. This is the duality of structures. Duality in structure reconciles action with structure and forms the basis of structuration theory since there is a patterning of relations through time and space (Cohen, 1989).

An important aspect of structuration theory is the idea of unconscious motivation. An agent may not be conscious of their motives as to why they acted a particular way. Structures can constrain motivation and a constraint is for instance a limitation of face-to-face interaction in time and space (Cohen, 1989). A constraint for one agent may be an opportunity for another agent since it depends on the agent's position within the structural pattern. Giddens (1984) suggests that there are three constraints: material constraints, sanctions and structural constraints.

Material constraint refers to human limitations such as there must be time to sleep. Two kinds of material constraint are: coupling and capability. Coupling constraints are conditions of human corporality (relating to the physical capabilities of the human body) that would restrict activities (Cohen, 1989). Capability constraints are physical conditions that shape opportunities for activities (Cohen, 1989).

Sanctions are imposed constraints. Sanctions relate to certain norms, rules and laws that people are expected to comply with, for example power relations may be viewed as a sort of sanction since the individual feels inclined to respond in a particular manner and as a result, behavior may be constrained. **Structural** constraint is derived from the inter-dependency of ties and although not a very clear concept, it has been defined as relating to position-practice (Cohen, 1989) which relates to the position of an agent in the network and the implications of that position for the possible actions of the agent.

In summary, structuration theory is about the regularity of interdependent relationships and their reciprocal practices (Cohen, 1989). Reciprocal practices result in integration of action and influence behaviour and action is therefore explained through the patterns of network structures. Specifically, network agents are placed within structures that can influence their behaviour.

4.3 Inter-organisational Knowledge Sharing

This section combines literature from both knowledge management in Chapter 2 and social networks in Chapter 3 and reviews knowledge networking literature. This section about inter-organisational knowledge sharing is divided into three parts: the characteristics of inter-organisational knowledge sharing, conceptualising knowledge sharing systems and facilitating conditions of knowledge sharing systems.

Inter-organisational knowledge sharing means that knowledge is shared between business people in different businesses. The earliest writings on 'knowledge networks' argued for relational ties to be used as a means of knowledge sharing (Skyrme, 1999) as networks exist and knowledge may be shared through these structures. The network can therefore become a knowledge sharing mechanism. Structural components of the network are formed through communication links which allow information to flow (Skyrme, 1999; Monge and Contractor, 2003). The importance of inter-organisational knowledge sharing is also discussed in the writings of Lawson and Lorenz (1999) who argued for collective learning of tacit knowledge among regionally clustered businesses to foster innovative capacity.

Shared knowledge helps build up knowledge stocks within people who network socially, these knowledge stocks build up over time and are important for the success of businesses in that industry. A focus on knowledge stocks is important since one of the major problems for businesses is the ongoing creation and dissemination of knowledge (Demarest, 1997). Knowledge can be shared through networking processes as knowledge is diffusible and can therefore be diffused across the network's structure (Skyrme, 1999). Knowledge sharing is an incremental process since it takes time for tacit knowledge explication (draw out) and sharing of embedded knowledge to take place (Halme, 2001). Networks of knowledge sharing therefore emerge as a new knowledge management model (Seufert et al., 1999) and networking processes provide acquisition of knowledge and generate information required for business purposes (Kogut, 2000).

4.3.1 The Characteristics of Inter-organisational Knowledge Sharing

This section concerning the characteristics of inter-organisational knowledge sharing is divided into two parts: the ties and nodes that bind and the instrument of knowledge capture. First, the ties and nodes that bind discusses how knowledge is capable of flowing and second, an instrument of knowledge capture argues the need to examine inter-organisational networks as knowledge sharing mechanisms.

4.3.1.1 The Ties and Nodes that Bind

Business people often network and form business and social relationships (Marouf, 2007; Liebowitz, 2007). These relationships can be viewed as inter-organisational networks since relational ties are ongoing and are formed between different businesses. Ties are described as being weak or bridging and nodes are between. **Weak ties**, formed through bridging, are more likely to link members of different small groups than are strong ties (Granovetter, 1973). Indirect relations, or **weak ties**, facilitate search for knowledge, but, impede the transfer of complex knowledge from outside of the organisation (since there is a lesser chance that the knowledge may be shared through a weak tie) (Hansen, 2002). Another aspect of a network's structure, **between-ness** shows the location of a business agent in relation to two network sub-groups within the network (Scott, 2000). Between-ness is an indication of a network's **bridging** characteristics. **Bridging** characteristics relate to inter-connections between networks and can also be termed a tie (Granovetter, 1973). Through bridging network resources can be brokered and thus influence the innovative capability of network agents.

4.3.1.2 The Instrument of Knowledge Capture

Networks of knowledge sharing may not serve their purpose for two reasons. First, there is an assumption that knowledge is a resource provided by the network and knowledge is shared within inter-organisational networks (Powell et al., 1996; Osborn and Hagedoorn, 1997). It is argued that knowledge by its very nature is difficult to diffuse whether it is shared within or between organisations (Nonaka, 1998). Second, authors have viewed the reasons for the formation of business networks based on economic and general development realities rather than knowledge exchange needs (Gulati, 1998). As a result, there is need to understand whether a network is indeed an instrument of knowledge capture.

The structural characteristics of the network result in the knowledge transfer capability (Powell et al., 1996; Gulati, 1998; Kogut, 2000; Bell, 2005). A network is an instrument for knowledge capture according to Santaro et al. (2006) while Fadeeva (2004) states that information assembles within networks. Whether or not a network is an instrument of knowledge capture depends on the characteristics of the network (informal network structure, network position, absorptive capacity and related knowledge); the characteristics of the agent (relational embeddedness); and the type of knowledge (tacit or explicit).

Aspects of **informal network structure** formed through social cohesion are argued to affect knowledge transfer (Reagans and McEvily, 2003). Social cohesion includes the willingness and motivation of individuals to invest time, energy and effort in sharing knowledge with others and is often measured using the strength of ties. Although strong ties and social cohesion are correlated the benefits provided by a strong tie do not require social cohesion (Reagans and McEvily, 2003). Accordingly, the characteristic of the network tie whether strong or weak needs to be examined.

In addition, **network position** and **absorptive capacity** affect innovation and performance (Tsai, 2001). A **network position** is based on where an agent is placed within the overall network pattern, such as a central position. According to Tsai (2001) organisational units (intra-organisational) produce more innovations and better performance based on their central network positions since central network positions provide access to new knowledge developed by other units, however innovation and performance are achieved based on those agents' **absorptive capacities** (Tsai, 2001). This means that where an agent is placed determines what this agent gets to know and therefore their position affects their ability to obtain knowledge. In addition, innovation and performance was also impacted by absorptive capacity because it moderates the effect a network position has on innovation and performance. Thus, the extent to which networks operate as instruments of knowledge capture also depends on the absorptive capacities of network agents.

On the other hand, a beneficial network position may not explain how knowledge is shared (Hansen, 2002). Hansen's (2002) intra-organisational work shows that knowledge sharing occurred if the shared knowledge is related. **Related knowledge** means different parts of the business possess the same competencies. Related knowledge therefore increases absorptive capacity and shared knowledge is also affected by whether the relationship is direct or indirect and the cost (Hansen, 2002). Hansen (2002:245) concludes,

> *"by incorporating the dual dimension of relatedness in knowledge content and network relations and the issues of indirect ties and cost considerations … is likely to provide new insights into the question of why knowledge sharing … leads to performance improvement."*

Relational embeddedness is viewed as affecting knowledge creation and transfer. Relational embeddedness relates to tie strength, trust and shared value systems and these characteristics affect the transfer of both tacit and explicit knowledge (Dhanaraj, Lyles, Steensma and Tihanyi, 2004). Dhanaraj et al. (2004:438) noted that *"relational embeddedness had a stronger impact on tacit knowledge transfer than on explicit knowledge"* transfer. This is because of the trust element. Trust is more important for the transfer of tacit knowledge than for explicit knowledge whereas ties and shared values are important for the transfer of explicit knowledge. Relational embeddedness impacts on the direction and type of knowledge flows and thus the level of trust is important to understand knowledge sharing.

Networks allow the sharing of **tacit knowledge** (Augier and Vendelo, 1999). Networks are therefore mechanisms through which the knowledge of individuals is shared between different businesses. A study of how knowledge is shared between business people operating in networks is therefore needed for two reasons. First, since networks are ever evolving entities and therefore 'loose', controlling and directing flows become difficult. Second, the usefulness of shared knowledge is not known in advance, that is, it is not previously known when knowledge will be needed. Consequently, how networks allow sharing of tacit knowledge can usefully be examined.

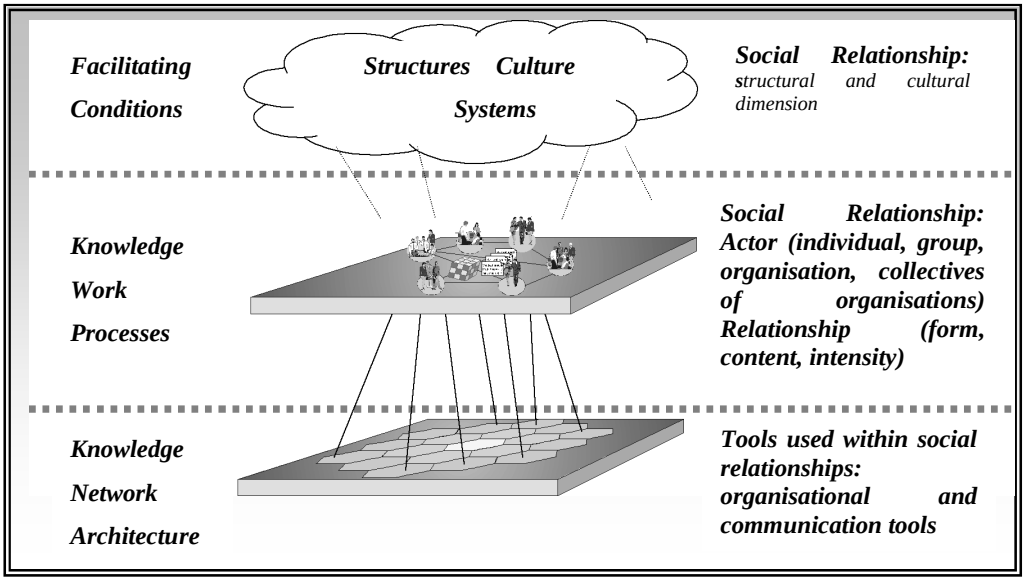
4.3.2 Conceptualising Knowledge Sharing Systems

Inter-organisational knowledge sharing models may be viewed as those that are built up as knowledge networks and those which engage communities of practice (Seufert et al., 1999; Parent, Roy and St-Jacques, 2007). Communities of practice are viewed as groups of people coming together to share knowledge, insights and experiences. Such groups are informal, voluntary gatherings based on shared goals. On the other hand, the knowledge network model presents a new opportunity for knowledge management. Such a model can explain how and why an inter-organisational knowledge sharing system operates.

Knowledge sharing systems are based on interaction and structural dimensions and are the basis for explaining knowledge movements within network structures (Stokowski, 1994). First, a knowledge network framework (KNF) has been conceptualised (Seufert et al., 1999) and the KNF comprise three components: facilitating conditions, knowledge work processes and knowledge network architecture (Figure 4-1). Facilitating conditions enable or inhibit knowledge creation and transfer. As such, facilitating conditions are based on the characteristics of knowledge sharing such as altruism, instrumental needs and having a positive attitude towards sharing knowledge (Choi and Hilton, 2005). Knowledge work processes may be viewed as intra-organisational or inter-organisational. Knowledge network architecture relates to the tools of knowledge sharing, such as sending electronic mail and having social relationships, which are used when communicating through the network. Consequently, knowledge networks are social networks involving knowledge agents sharing knowledge.

Figure 4-1 Knowledge Network Framework – a micro perspective

Source: Seufert, von Krogh and Bach (1999)

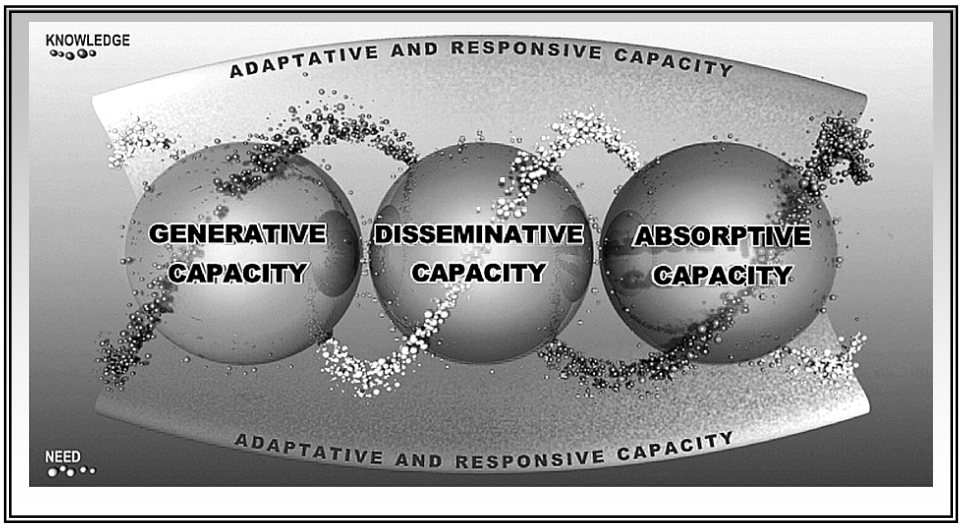


Second, Parent, Roy and St. Jacques (2007) used systems theory to explain a knowledge transfer system. They proposed a new systems-based knowledge transfer model. By way of the model, they showed how the social system generated, disseminated and used knowledge. Thereby, knowledge is viewed as a systemic, socially constructed, context-specific representation of reality (Parent et al., 2007). Their dynamic knowledge transfer capacity (DKTC) model comprises four components and these components are: generative capacity, disseminative capacity, absorptive capacity and adaptive and responsive capacities (Parent et al., 2007).

Generative capacity relates to the intellectual and creative capital. Disseminative capacity relates to the ability to contextualise, format, adapt, translate and diffuse knowledge through a social or technological network. Disseminative capacity is facilitated through information brokers. Absorptive capacity (a concept credited to Cohen and Levinthal, 1990) relates to prior knowledge and readiness to change and such capacity is facilitated by trust. Adaptive and responsive capacities relate to the ability to learn and renew and such ability is built through multiple feedback loops (Figure 4-2).

Figure 4-2 The dynamic knowledge transfer capacity model (DKTC)

Source: Parent, Roy and St. Jacques (2007)



Elements of both the knowledge network framework (KNF) and dynamic knowledge transfer capacity model (DKTC) are conceptualisations of inter-organisational knowledge sharing systems. The generative capacity in the DKTC (Figure 4-2) and the knowledge network work processes of the KNF (Figure 4-1) can be linked. Work processes involve agents who are engaged in business and social relationships and therefore a network pattern is formed. Social network and social capital theories therefore explain generative capacity. In that, the inter-dependency of the network pattern (social network theory) and the resources of the network (social capital theory) explain the network's capability to generate knowledge. The social network provides capital, such as knowledge, as part of the network's function (Burt, 1997b; Gulati, 1998; Kogut, 2000).

In addition, the disseminative capacity of the DKTC is related to the knowledge network architecture of the KNF. Dissemination means that knowledge is shared across the network. Knowledge is shared through a communication process. Communication processes are the architecture and this architecture is built through knowledge creation processes (Nonaka and Toyama, 2003). Both generative and disseminative capabilities are moderated by agents' absorptive capacities. As a result, in order to understand how an inter-organisational knowledge sharing system operates, one needs to understand the facilitating conditions which enable knowledge sharing capability. The next section reviews facilitating conditions of knowledge sharing systems.

4.3.3 Facilitating Conditions of Knowledge Sharing Systems

Authors have studied the conditions which enable inter-organisational collaboration including trust, collaboration, attitude and values, network structure, and type of knowledge (Gray, 1985; Skyrme, 1999; Santoro et al., 2006; Yang, 2007). Inter-organisational knowledge sharing systems are viewed as knowledge networks (Swan et al., 2000; Contractor and Monge, 2002; Hansen, 2002; Pena, 2002). The main concept is that networking or rather having relationships between business people fosters knowledge creation (Cross et al., 2001) and knowledge is created as a result of the system.

Facilitating conditions are relational qualities. Relational qualities promote effective knowledge sharing through knowledge, access, engagement and safety (Cross et al., 2001). Knowledge is sought from another person that an individual thinks has the knowledge and so a bond (tie) may be formed. Engagement is the knowledge sharer's ability to understand the problem and share the appropriate knowledge. Arguably, such engagement is developed through prior experiences and trust. Safety promotes learning since the knowledge seeker is comfortable with disclosing their lack of knowledge. Presumably, safety is enhanced through personal rather than business ties and facilitated based on a relationship of trust.

4.3.3.1 Trust

Based on the literature, **trust** seems to be the foundational concept for facilitating knowledge sharing (Powell et al., 1996; Bock and Kim, 2002; Abrams, Cross et al., 2003; Choi and Hilton, 2005). Knowledge sharing is a social process (Scott and Laws, 2006) and is motivated based on mutual understanding and trust (Bock and Kim, 2002; Abrams et al., 2003). Network ties form a network configuration which becomes stable through the shared goals, culture and trust of network agents (Inkpen and Tsang, 2005). Trust facilitates both asking for and the giving of resources (Kadushin, 2004) and plays a key role in the willingness to share knowledge (Inkpen and Tsang, 2005). Trust must be nurtured for information sharing to take place through networks (Wilson and Moller, 1995; Kalafatis and Miller, 1997; Davenport and Prusak, 1998; Abrams et al., 2003; Monge and Contractor, 2003; Rogers, 2003).

There are ten (10) ways to promote trust and determine trustworthiness (Abrams et al., 2003). These are: internal, organisational and externally based. Internal factors relate to people who were trustworthy and who tend to: (1) act with discretion; (2) be consistent between word and deed, (3) ensure frequent and rich communication, (4) engage in collaborative communication and (5) ensure that decisions are fair and transparent. Interpersonal trust is promoted through organisational factors such as: (6) establish and ensure shared vision and language; and (7) hold people accountable for trust. Finally, trust is obtained through external factors of: (8) create personal connections, (9) give away something of value and (10) disclose expertise and limitations.

Trust is formulated through a number of other factors. Trust can play a mediating role in effective knowledge transfer since trust determines whether knowledge is transferred through stronger or weaker ties (Levin and Cross, 2004). Trustworthiness can be perceived either as benevolence-based or competency-based (Levin and Cross, 2004). Benevolence-based trust is viewed as a considerate act of caring about sharing information and may be built up through among other things emotional bonds. Competency-based trust is based on the perceived knowledge of the knowledge sharer and is built up through stronger ties. Stronger ties result in greater knowledge of someone's skills and abilities and common ways of thinking. Results show that benevolence-based trust consistently mattered in knowledge sharing and that competence-based trust matters for tacit knowledge sharing (Levin and Cross, 2004). Consequently, tacit knowledge is shared through stronger ties.

4.3.3.2 Collaboration

Another condition is **collaboration**. Gray (1985) in proposing optimum conditions for collaboration developed a process model of collaboration which included problem-setting, direction-setting and structuring. Collaboration is required when a problem emerges and then a certain direction is taken and certain actions are necessary to solve the problem. Conditions facilitating **problem-setting** include: identification of stakeholders and their expectations about outcomes; recognition of the degree of interdependence; legitimacy of stakeholders; and convenor characteristics. Problem setting is therefore attributed to the characteristics of agents. Conditions facilitating **direction-setting** comprise: coincidence in values among stakeholders and dispersion of power among stakeholders. Direction setting depends on the motives of agents. Lastly conditions facilitating **structuring** include: degree of ongoing interdependence, external mandates, redistribution of power and geographic factors. Structuring involves actions taken to adjust to changes in the environment. The conditions which facilitate structuring are particularly important to understand how informal networking in particular emerges.

Knowledge sharing activities involve dialogue and collaboration through network structures of individuals and processes which capture knowledge. Dialogue and collaboration between organizations are often viewed as strategic needs (Beeby and Booth, 2000; Inkpen and Tsang, 2005; Santoro et al., 2006) which are met when businesses form relationships based on their perceived knowledge exchange benefit (Powell et al., 1996; Osborn and Hagedoorn, 1997; Gulati, 1998; Kogut, 2000). For instance, based on the strategic need business people may form relationships with competitors. Knowledge sharing, even with competitors, is beneficial to the organization and more so to the community as a whole (Skyrme, 1999; Ingram & Roberts, 2000).

Understanding and knowledge are created through **human interaction** (Stokowski, 1994). According to Kreiner and Schultz (1993), human interaction results in the discovery, exploration and crystallisation of social networks. Discovery is the initial opportunity to network and is the beginnings of a collaborative process, exploration is an exchange of ideas and involves the actual collaborative process and crystallisation is the ongoing collaborative process wherein relationships become inter-dependent. The cycle of discovery, exploration and crystallisation emerges with each initial human interaction.

4.3.3.3 Knowledge Sharing Attitudes and Values

Attitudes and values towards knowledge sharing are other facilitating conditions (Abrams et al., 2003; Yang, 2008). A positive attitude towards knowledge sharing resulted in a positive intention and actual knowledge sharing behaviours (Bock and Kim, 2002). Achieving organisational goals is a value and therefore a reason for inter-organisational knowledge sharing (Bock and Kim, 2002; Abrams et al., 2003; Hansen, Mors and Lovas, 2005). Attitudes and values develop based on certain conditions within different social networks and therefore provide an explanation as to why knowledge is shared (Hansen et al., 2005). These conditions are: the decision to seek knowledge, search costs and costs of transfers. Evidence suggests that more frequent interactions reduce negative perceptions of others and increase knowledge seeking (intra-organisational) (Hansen et al., 2005). Additionally, weak ties benefit search for knowledge by reducing costs, while strong ties help transfer of knowledge by reducing transfer costs (Hansen et al., 2005).

4.3.3.4 Stickiness

Stickiness relates to the context specificity of shared knowledge. Liebowitz (2007) proposed the concept of syrupy shared knowledge which he suggests is a mixture of stickiness and fluidity, syrupy means that knowledge is sticky but still flows. The particularly difficult aspect of sharing knowledge relates to the fact that knowledge is sticky. **Stickiness** in relation to knowledge sharing refers to knowledge remaining within the context in which it was developed (Davenport and Prusak, 1998). Thus, knowledge becomes sticky when it is embedded in a particular context which may mean that it cannot be adapted to another context. The sticky nature of knowledge impedes knowledge dissemination (Szulanski, 1996; Szulanski, 2000; Liebowitz, 2007). Therefore, sticky knowledge remains with an individual. If knowledge cannot be shared as a result of stickiness, inter-organisational collaboration which allows innovation is limited (Powell et al., 1996).

Knowledge stickiness means that knowledge is not released and therefore not shared. With 'sticky' knowledge the transfer process will not be initiated and implemented. Factors that affect an opportunity to transfer knowledge are more likely to predict difficulty at initiation and factors that affect the execution of knowledge transfer are more likely to predict difficulty at implementation (Szulanski, 2000). Initiation starts when a decision is made to share knowledge. Implementation involves putting the knowledge to use. Elements of stickiness are: source, channel, message, recipient and context and based on these elements, the predictors of stickiness are strength of tie, personality (dispositions and abilities of the source and recipient), trust, absorptive capacity and organisational context (Szulanski, 2000). Implementation facilitators include fertility (facilitates the inception and development of transfers) or barrenness (hinders the gestation and evolution of transfers) (Szulanski, 2000).

It therefore becomes necessary to understand the circumstances by which thick and sticky knowledge are shared. Knowledge networking is one mechanism by which knowledge can be 'unstuck'. Knowledge networks are informal emergent entities that are ongoing through space (localities) and time (Davenport and Prusak, 1998). A knowledge network may also be described as the information connections between people, in various businesses within an industry (Skyrme, 1999; Liebowitz, 2007). Through the network, knowledge is transformed by taking on various characteristics: "*expandable, compressible, substitutable, transportable, diffusive and sharable"* (Skyrme, 1999:48-49). These characteristics are transformation processes which improve the flow of shared knowledge. The network facilitates knowledge sharing by providing a mechanism to transform knowledge. As a result, sticky knowledge becomes virtualised and therefore is shared beyond organisational boundaries. Virtualisation is enabled by reconfiguring space, time and structure boundaries through the knowledge network (Skyrme, 1999).

4.4 Conclusion

Systems, social systems and structuration theories provide the theoretical foundation for understanding the workings of inter-organisational knowledge sharing networks. Businesses within networks of shared knowledge benefit from the social capital of the network resources (van Der Gaag and Snijders, 2005) and thus a knowledge networking conceptualisation is supported by systems theory (Diakoulakis et al., 2004; Jackson, 2005). The proposition is that information sharing is a mutual ongoing activity which is based on certain communication patterns formed through people in businesses having personal and business relationships which is supported by structuration theory (Giddens, 1984).

Consequently, there is an association of social networking and knowledge sharing being argued in the literature. Social networking and knowledge sharing are related activities which can be examined as an inter-organisational knowledge sharing system within the same piece of work. An inter-organisational knowledge sharing system was conceptualised and the facilitating conditions of the system discussed. The business's search for information outside the organisation (Choo, 1998) potentially makes social networking particularly important (Zander and Kogut, 1995; Powell et al., 1996; Kogut, 2000). An inter-organisational knowledge sharing system may be summarised based on: motives to share knowledge, knowledge exchange (Swan et al., 2000; Carlsson, 2003), competitive clusters (Hawkins, 2004; Novelli et al., 2006), which benefit from [cross-institutional] knowledge spirals (Nonaka, 1998) and thereby a complex adaptive system is formed (Farrell & Twining-Ward, 2004; Sherif & Xing, 2006).

The next chapter outlines the importance of social networks and information sharing for people in tourism and hospitality businesses. Evidence in the literature shows that social networking facilitates knowledge sharing (Marouf, 2007; Liebowitz, 2007), but there has been limited application of these concepts to the tourism sector. It is important to understand the how and why inter-organisational knowledge sharing works for the benefit of the tourism and hospitality agents whose operations contribute to building a competitive tourism destination.