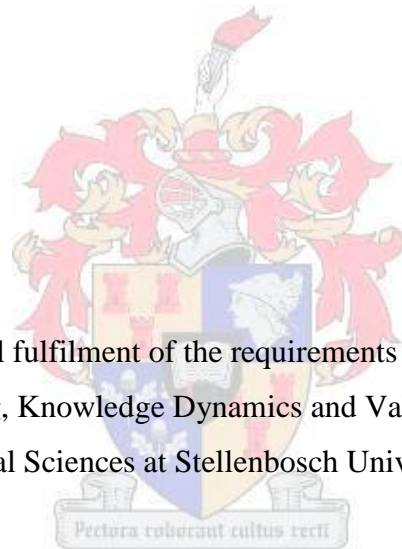


**BETWEEN NETWORKS AND COMMUNITIES:  
CHALLENGE FOR AN OPTIMAL INNOVATION  
STRUCTURE**

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Philosophy (Decision Making, Knowledge Dynamics and Values) in the Faculty of Arts and  
Social Sciences at Stellenbosch University

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## **DECLARATION**

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own original work, that I am the authorship owner thereof (unless to the extent explicitly otherwise stated) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: 21/11/2012

## ABSTRACT

The world economy has over the last few decades rapidly moved from an industrial economy to a knowledge economy, creating a new business reality. Organisations have increasingly realised the importance of innovation as it has become the main sources of their competitive advantage. Innovation networks and communities of practice are two areas of inquiry of interest to organisational management, especially when innovation is an important organisational goal. These two areas are separated by different foci, assumptions and approaches. For this reason they are often seen as opposing approaches to enabling innovation. The thesis argues that whilst innovation networks and communities of practice are different structures, they have complementary roles to play in innovation.

It is shown that innovation networks possess the structural attributes, according to three network concepts, necessary to facilitate and support exploration, as well as allow the large-scale diffusion of information and knowledge. In the same sense, communities of practice are shown to possess the structural attributes for exploitation, as well as implementation and small-scale diffusion, to take place which are also required for successful innovation. Subsequently, the argument is that combining the structural elements of innovation networks and communities of practice may allow organisations to move closer to the optimal innovation structure of a particular context, leading to improved innovation performance. Innovation networks and communities of practice exhibit different sensitivities to management which requires management to be more flexible and subtle when trying to facilitate their creation and development. Creating an optimal innovation structure, just as innovation networks and communities of practice individually, requires organisations to create an enabling context for them to thrive in.

Consequently, management is required to exhibit a dual focus on network and community facilitation and support in order to improve innovation. The practical question then becomes to what extent management interventions in aid of the one structure are counter-productive for the other. The challenge is to direct networks in order to gain access to novel knowledge as well as diffuse it throughout the network, whilst at the same time enabling communities to develop in aid of proper exploitation, small-scale diffusion and implementation.

## OPSOMMING

Die wêreldekonomie het oor die laaste paar dekades vinnig van 'n industrieel geïntereerde na 'n kennis geïntereerde ekonomie verander en gevolglik 'n nuwe besigheidsomgewing vir organisasies geskep. Organisasies het toenemend die belangrikheid van innovasie besef soos innovasie die hoof bron van 'n organisasie se kompeterende voordeel geword het. Innovasienetwerke en praktykgemeenskappe is twee areas van ondersoek wat van belang is vir organisatoriese bestuur, veral wanneer innovasie 'n belangrike organisatoriese doelwit is. Die twee velde verskil op grond van hul uiteenlopende fokuspunkte, aannames en benaderings. Gevolglik word hul as teenstrydige benaderings tot innovasie beskou. Die tesis beweer dat alhoewel innovasienetwerke en praktykgemeenskappe verskillende strukture is, hul komplementêre rolle in innovasie vervul.

Dit word gestel dat innovasienetwerke oor die nodige strukturele eienskappe beskik, op grond van drie netwerkkonsepte, om die ondersoek vir nuwe kennis te fasiliteer en ondersteun asook om die grootskaalse verspreiding van inligting en kennis aan te moedig. Terselfdertyd word geargumenteer dat praktykgemeenskappe oor die nodige strukturele eienskappe beskik om ontginning van bestaan-de kennis te bevorder, asook om die implementering en kleinskaalse verspreiding van nuwe kennis aan te moedig wat ook benodig word om die proses van innovasie te voltooi. Gevolglik word daar geargumenteer dat die strukturele kombinerings van innovasienetwerke en praktykgemeenskappe organisasies kan help om nader aan 'n optimale innovasiestruktuur in elke spesifieke konteks te beweeg, wat innovasieprestasie moontlik sal laat verbeter. Innovasienetwerke en praktykgemeenskappe toon verskillende sensitiwiteite tot bestuursingrype wat bestuurders dwing om meer buigsaam/veelsydig en subtiel op te tree wanneer hul die ontwikkeling van dié strukture probeer fasiliteer. Die ontwikkeling van 'n optimale innovasiestruktuur benodig, nes innovasienetwerke en praktykgemeenskappe, 'n omgewing wat dit in staat sal stel om daarin te floreer.

Gevolglik benodig bestuurders 'n gesamentlike fokus op beide netwerke en gemeenskapsfasilitering en ondersteuning om innovasie in hul organisasies te bevorder. Die praktiese vraag is dan tot watter mate bestuursingrype vir een tipe struktuur, teenproduktief is vir die ander een. Die uitdaging is om netwerke aan te moedig om toegang tot nuwe kennis te verkry asook om dit verder deur die netwerk te versprei, terwyl praktykgemeenskappe gesamentlik aangemoedig word om bestaande kennis te ontgin, te implimenteer en te versprei.

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## **DEDICATION**

I would like to dedicate this thesis to my loving parents, Mr Marius and Mrs Annette Linda Koen, and my sister Ms Marli Koen for instilling the importance of hard work and higher education. Thank you very much for all your love, support and continuous encouragement. I could not have done it without you.

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# CHAPTER 1

# 1 INTRODUCTION

## 1.1 The New Business Reality

The world economy is living through a period of profound change and transformation, driven by globalisation and reinforced by the development of information and communication technologies. Technological progress allows for the increased transmission and use of information and knowledge. These combined forces is altering the way people live and changing the way organisations do business throughout every economic sector. The nature of production, trade, employment and work has changed and will continue to change in the coming years (Carayannis et al., 2006:420). Over the past few decades the world economy has rapidly moved away from an industrial economy to a knowledge economy. The knowledge economy can shortly be defined as “a state of economic being and a process of economic becoming that leverages intensively and extensively knowledge assets and competencies as well as economic learning to catalyse and accelerate and robust economic growth” (Carayannis et al., 2006:422). In an industrial economy, natural resources and labour was the main resources. In the new economy, knowledge has become the most critical economic resource. In fact, knowledge has become the principle component of value creation, productivity and economic growth. The generation and exploitation of knowledge has become the predominant way towards wealth creation. It is not simply about generating new knowledge, but making more effective use of both new and existing knowledge (Houghton et al., 2000:1). Traditional economic resources such as land, labour and capital is still important in the knowledge economy, but being able to add value to products and services through knowledge is what differentiates leading organisations from their competitors. In order to succeed in this economy, businesses must possess the ability to improve and innovate on a regular and continuous basis (Kessels, 2004:165).

Over the years, many writers have used different terms to refer to this new economy. It has been referred to as the ‘information society’ (Giddens, 1994), the ‘learning society’ (European Commission, 1996), the ‘network society’ (Castells, 2000), the ‘learning economy’ (Field, 2000) and ‘economies of expertise’ (Venkatraman & Subramaniam, 2002). The term knowledge economy was originally introduced by Fritz Machlup in 1984 to illustrate the increasing importance of knowledge for economic prosperity and growth (Pyka & Saviotti, 2002:77). What all these terms have in common, is that learning and collaboration are key requirements in today’s business environment. Organisations are required to learn rapidly by

making use of both internal and external information. It is the only way organisations can continuously improve and innovate in order to generate a sustained competitive advantage (Kessels, 2004:167). The knowledge economy is characterised by five main trends. Firstly, we have seen the development of a service-based economy. The service-based economy's activities demand intellectual content in order to become more pervasive and decisive. Secondly, there has been an increased emphasis on higher education and continuous learning. Life-long learning is encouraged to ensure the effective use of the rapidly expanding knowledge base. Thirdly, massive amounts of investment have been made in for example: research and development, training, education, software and similar services (Carayannis et al., 2006:420). Fourthly, we have witnessed a massive increase in competition. The explosion in competition between organisations and even countries has been based on new product design, marketing approaches, as well as organisational structuring and design. Lastly, economies have continuously been restructured to accommodate the constant change in needs and demands (Carayannis et al., 2006:421). This has left organisations and nations with both immense opportunities to make use of and abundant challenges to overcome in this new era.

This economic shift has had a remarkable impact on how organisations should organise work. Nowadays individuals, teams and companies need to develop the necessary competencies to be able to stay competitive. In order to participate in the business environment, each organisation must ensure knowledge productivity. Consequently, traditional approaches to management, training and development will not create a satisfactory learning environment that is required for knowledge work. Management must find new ways to turn their daily work environment into a powerful learning environment (Kessels, 2004:165). As managers become aware of this dramatic change that is taking place, they will find that management as we use to know it has completely changed. The way we think about the organisation, business relationship, business models, values, culture and leadership will have to change to compensate for the new economic reality (Allee, 2000). If it is believed that knowledge is embodied in people, the need for collaboration and networking between employees is required. Creating the environment for employees to share knowledge among one another has become critical for the development of an organisation. Organisations are required, not to enable just any networks, but to specifically foster networks that find their interrelation through the mutual attractiveness, shared appeal, joint interest and the passion of their participants. The knowledge economy requires not only human capital, but social capital to support it. Improvement and innovation require human capital that is supported by a shared

responsibility, trust, integrity and respect for human dignity. The only way organisations can ensure all these elements, is by critical individual learning (Kessels, 2004:167). This fits well with the fact that today, more than ever, individuals want to be in control of their own working lives and expect to actively contribute to the economy and society as a whole (Kessels, 2004:168).

Beside individuals networking within an organisation, inter-organisational networking has become a requirement. Today organisations can decide which activities they will undertake individually or collectively. Knowledge is spread across organisational boundaries, necessitating inter-organisational relationships in order to gain access to required knowledge resources (Houghton et al., 2000:11). Organisations search for inter-organisational partners and networks to extend their resource base, allowing them to concentrate on their core competencies, rather than developing every required resource themselves (Lampela, 2009:13). Inter-organisational relationships help organisations to share the cost and risk associated with innovation. Organisations also gain access to new knowledge and other organisational resources which they would not have otherwise possessed internally. Finally, organisations can also gain access to new markets to which they previously did not have access to (Houghton et al., 2000:11). In effect, networks have become a natural organisational solution for learning and innovation (Lampela, 2009:13). Innovation has thus become the result of numerous interactions between various organisations and institutions. Some see this interaction network as an innovation system which ultimately affects the innovative performance of organisations and the economy as a whole (Houghton et al., 2000:11).

The knowledge economy has rendered the traditional way of managing an organisation through direct control based on obedience and loyalty by employees as obsolete. The complexity of work is increasing and the role of knowledge creation has become increasingly critical. Resultantly, the top-down approach is no longer the appropriate managerial approach. Management must rather be done at every level of the organisation, requiring knowledge contribution from every employee. The knowledge economy requires a whole new approach to employing and managing today's so-called knowledge workers (Kessels, 2004:170). Knowledge within organisations becomes productive when knowledge creation and application results in gradual improvements and radical innovations. These innovations can either be of operating procedures, products or services. Collaborative relationships are what are required to ensure these innovations take place. It is exactly this knowledge work and

collective learning that cannot be enforced by management through power or control. Knowledge workers take charge of their own development, creating these network relationships with one another on the basis of mutual benefit and joint interest. Resultantly, new ways of organising work for knowledge production need to be developed. Organisations are becoming increasingly aware that knowledge work may be stimulated and supported through a variety of means (Kessels, 2004:170). In order for organisations to facilitate and manage innovation, one must first understand what constitutes innovation and how the process can be supported. The following section explores and unpacks the field of innovation and the innovation process in general.

## **1.2 Innovation**

Since the 1990's there has been an increasing emphasis on innovation in the business world, rapidly replacing efficiency and quality as the main sources of an organisation's competitive advantage. With the realisation of the importance of innovation, an extensive body of literature has developed in order to identify how best to diffuse and implement innovations. Resultantly, the emphasis in the innovation literature started shifting to networks and networking as viable options for innovation. The importance and potential of external networking became clearer, as individuals involved in networks have been shown to facilitate the diffusion and adoption of new ideas. It also became a means for organisations to stay informed on new information, knowledge and technologies, as these individuals operated as boundary spanners (Swan et al., 1999:262).

The body of literature on innovation has been particularly broad, incorporating many diverse theories and perspectives. The perspectives range from the more traditional structuralist approaches, to the more process-oriented approaches. The structuralist perspectives perceive innovation as an entity with fixed parameters which is developed externally, such as a new management practice or technology, assembled by suppliers and then conveyed to employees where it can serve as a competitive advantage for them (Swan et al., 1999:262). These perspectives treat networks as structures through which information and knowledge can be transferred without any trouble, neglecting the dependency of innovation on the social and organisational context. In contrast, process perspectives argue that innovation should be seen as a "complex, time phased, politically charged design and decision process often involving multiple social groups within organisations" (Swan et al., 1999:263). Innovation is tremendously sensitive to the organisational context and depends on knowledge, skills and



commitment of numerous groups and stakeholders. The idea of process perspectives is to examine these complex processes of innovation and ultimately identify possible ways to facilitate and support these processes. This leads to a general process perspective definition of innovation as “the development and implementation of new ideas by people who over time engage in transaction with others in an institutional context” (Swan et al., 1999:263).

Innovation is normally roughly classified as either innovation as novelty or innovation as change. Thus, the literature on innovation predominantly focuses on the activities of exploration and exploitation. Exploration concerns the discovery of new ideas and knowledge which may lead to novel products, services, procedures and practices based on radical innovation (Newell et al., 2009:53). Exploitation, on the other hand, concerns the improvement or correction of existing knowledge, continuously improving the knowledge base through incremental innovation, gradually leading to the constant improvement of products, services, procedures and practices (Newell et al., 2009:54). However, a process perspective is taken in this thesis as innovation is seen as a process consisting of several recurring and intertwined activities. These activities do not take place linearly, but combines in a very complex, uncertain and highly political process, often resulting in many unpredictable outcomes. Innovation involves three main activities, namely the dynamic creation, diffusion and implementation of new ideas in different contexts (Newell et al., 2009:195). Thus, regarding innovation as only the activities of exploration and exploitation is therefore very partial (Newell et al., 2009:188).

Securing innovation in practice has proven to be a challenge as the three innovation activities combine into an unpredictable set of cumulative and iterative occurrences. The process consists of several actions and fortunate coincidences, where numerous actors, various forms of knowledge and organisational tasks interact within which chance plays a major role (Newell et al., 2009:194). The character of innovation demands organisational management to be more flexible and subtle in order to create enabling contexts for novel combinations of knowledge and practices to take place (Newell et al., 2009:194). Management is required to customise the processes used for enabling the process of innovation to a particular context and for its specific purposes, because what is good for one organisation may be bad for another (Newell et al., 2009:183). Many structures exist for organisations to utilise, however the focus of this thesis is on innovation networks and communities of practice and how these two structures can stimulate and support innovation within and between organisations.

### **1.3 Innovative Organisational Structures**

Organisations can make use of various network structures in order to facilitate and support innovation. These structures hold several benefits for the process of innovation, individually facilitating certain activities which contribute to an organisations innovation performance. Innovation networks and communities of practice are two fields of study focused on innovation. On a theoretical level these two fields of study has grown based on new theories and models which tries to explain them in different contexts. Together the search for better clarification and explanation of these concepts on a theoretical and practical level has led to some misconceptions that must be addressed. In the following sections a preview will be given on how innovation networks and communities of practice respectively have, for the purpose of this thesis, been misconceptualized and how they should rather be understood.

#### **1.3.1 Innovation Networks**

It is well known that modern organisations depend primarily on access to the latest knowledge and its application in innovative means in order to remain competitive. However, this increasing dependency on knowledge for innovation processes is only one aspect of the knowledge economy. Of equal importance is the fact that innovations are becoming increasingly more complex (Pyka & Saviotti, 2002:77-78). Consequently, modern organisations require collaboration between individuals, possessing diverse knowledge, to take place in order to innovate. Networks have proven to be a natural organisational structure for these interactive needs. They have the ability to connect the diverse knowledge of producers, suppliers and users in different organisations in order to facilitate rapid exchange and decision-making. Networking represents a mechanism for innovation and diffusion to take place, by bringing diverse knowledge together to combat the increased complexity and uncertainty of innovation in modern times. Networks serve as co-ordination devices to create resources and networking is an essential enabling factor of technological progress (Pyka & Saviotti, 2002:79).

Innovation networks, more specifically, have emerged as a new form of organisation within knowledge production. Pyka and Saviotti (2002:80) innovation networks have made three main contributions to organisational life. They point out that innovation networks provide coordination that enable and support inter-firm learning by accelerating the diffusion of information, knowledge and new technology. Furthermore, the exploitation of complementarities within networks is critical for mastering technological solutions which is

characterised by complexity and diverse knowledge areas. Lastly, innovation networks are organisational settings allowing for the exploration of synergies by the potential combination of complementary technological competencies, thus opening up the possibility for new technological opportunities to be exploited in further rounds of innovation. Research on innovation networks is relatively new and the field still lacks a dominant definition of what constitutes an innovation network (Pyka & Saviotti, 2002:81). Instead several models exist, each highlighting different aspects depending on the particular research focus. Furthermore, there is no indication whether innovation networks in different spheres exhibit common characteristics. In fact a standard model of an innovation network with common characteristics which apply to all forms does not exist. Little evidence in the literature can be found on the dynamics of innovation networks. Currently the literature struggles to answer questions on how innovation networks arise, develop over time and how they merge into other networks or cease to exist. Consequently, it is needed to extend and elaborate on the theory of what constitutes an innovation network and how it operates (Pyka & Saviotti, 2002:91).

It is believed that there is a general misconception of innovation networks and networking as a whole. Today, networking is seen as a new organisational structure which is required in order to survive in the knowledge economy. Some truth lay in these claims as acknowledged in the previous sections. But the misunderstanding of networks, such as innovation networks, arises when people proclaim that networks are the silver bullet to all modern organisations' problems. Organisations based on networking, especially for the purpose of innovation, are seen as the only way forward for business. In some cases even other organisational forms and structures are seen as outdated<sup>1</sup> or irrelevant for the modern business environment. This idealisation of networks is in fact not the answer to all the challenges organisations face. Establishing and maintaining networks is one of the main aspects which are misunderstood. Simply introducing individuals who can possibly benefit from one another is not enough to sustain networking. In order for networks to form and continuously lead to innovative interaction, a shared interest or practice is required. Participants require some aspect which bounds them together which may lead to mutual benefits. That is why networks require some sort of shared practice through a joined project or purpose. Establishing a good absorptive

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<sup>1</sup> Engeström (2007) believes that, in particular, the fluid nature of modern work calls for more dynamic structures. The development of products and services must be able to adapt to the changing needs of user and customers.

<sup>2</sup> Brown and Duguid (2001) believe that for an adequate account of learning in a web-enabled globalizing world, less emphasis should be placed on the community aspect.

capacity of all participants requires a form of incentive, a reason why they should work together. Resultantly, networks should not be seen as a solution on its own, replacing other organisational structures and tools, but rather as one of the necessities needed to succeed. In the next section a closer look will be taken on communities of practice and how they should be understood in terms of organisations, networks and innovation.

### **1.3.2 Communities of Practice**

In the last decade, growing attention has been given to communities of practice as a possible organisational tool for stimulating and supporting innovation. Communities of practice are self-organising and self-governing groups of people who share a passion for a common domain of what they do and strive to become better practitioners. These communities create value by developing and spreading new knowledge, productive capabilities and fostering innovation (Soekijad et al., 2004:3).

Even though the concept's popularity has grown, academic and empirical studies are still limited and, to a large degree, lacking. The studies that have been conducted have mostly focused on communities of practice in an intra-organisational context. This has raised the need for studies on communities of practice in inter-organisational settings. The transfer of communities of practice to an inter-organisational context is in line with the necessity for organisations today to organise themselves into networks in order to gain access to new knowledge (Soekijad et al., 2004:3). Within these networks which organisations form, communities of practice can be applied as a setting where knowledge can be developed and shared. They can be initiated in order to exchange and create new knowledge both within and between organisations (Soekijad et al., 2004:4). This highlights the need for knowledge-sharing groups such as communities of practice (Soekijad et al., 2004:5).

The importance of communities of practice as a tool for stimulating and supporting organisational innovation has been acknowledge, but a major line of critique proclaim that communities of practice are outdated. Critics believe that communities present a learning process which is old-fashioned in the current modern era. They argue that communities of practice are only suited for a learning process associated with craft production. Some believe that modern work requires far more dynamic structures (Engeström, 2007). Some other critics believe that there is too much emphasis placed on the community aspect of communities of practice to provide an adequate learning environment in the globalising world. They prefer networks as a more appropriate structure for handling the increasingly fluid connections

among individuals and continuously changing learning needs in the knowledge economy (Brown & Duguid, 2001<sup>2</sup>; Jewson, 2007)<sup>3</sup>.

This line of critique results from a general misconception of communities of practice that exist in terms of how they are structured and operate as supportive tools to organisations and innovation. Rather than thinking of communities of practice and networks as opposing, they could be seen as two types of structuring processes. They are in fact distinct in many ways where communities of practice emphasise identity and networks emphasise connectivity. But they can usually coexist peacefully and in some cases even enhance one another. Communities of practice are to a certain extent networks seeing that they involve connections among participants, but communities require an identification with a domain and a commitment to learning partnerships which are not necessarily in a network (Wenger et al., 2011:11). Communities of practice are one complementary organisational structure which can be used to support and stimulate networking and innovation. Communities of practice are an effective method to supply networks with a shared practice which is needed to allow successful networking and innovation to take place. Seeing networks as needing complementary structures and tools such as communities of practice and not regard them as opposing will eliminate the misconception people have on how networks such as innovation networks work.

These two approaches are brought together in this thesis to show that communities of practice and innovation networks hold more in common than is believed. Irrespective of the distinction between communities of practice and networks, I will argue that they are not opposing and are in fact in many ways complementary. As networks develop their interconnectedness, a sense of community may simultaneously develop. And a community's desire to learn about a shared domain can often lead to the encouragement to seek connectivity. Resultantly, they can correct or compensate for one another (Wenger et al., 2011:12). Furthermore, if they can be combined in organisations they can enhance the process of innovation together. Organisations should take notice of this interplay and complementarity of communities of practice and networks and effectively take advantage of its potential for learning and innovation. I will argue that the focus should not be on one or

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<sup>2</sup> Brown and Duguid (2001) believe that for an adequate account of learning in a web-enabled globalizing world, less emphasis should be placed on the community aspect.

<sup>3</sup> Brown and Duguid (2001) and Jewson (2007) prefer networks, as they seem more equipped for a business world where learning needs and connections are becoming increasingly fluid. As the internet allows us to connect across the globe, the notion of community becomes almost old-fashioned, according to them.

the other, but on how these two structures can intertwine and integrate within a group. Organisations should investigate how they contribute to the cohesion and functioning of a group. Organisations should ask questions such as: For which participants does each concept dominate? What learning opportunities do they offer and what value do they provide (Wenger et al., 2011:10)? Seeing communities of practice and networks as complementary and not opposing will enhance an organisation's learning processes and ultimately lead to improved innovation.

#### **1.4 Optimal Innovation Structure**

Nooteboom and Gilsing (2004) are two of the well-known theorists investigating the optimality of network structures and whether it is possible to create an optimal network structure. They argue that no such thing as a universally optimal network structure exists for every network in every situation. Optimality is rather subject to the institutional environment in which the network is embedded. Consequently, optimality of a network structure, as well as its coordination mechanism, varies with different contexts. Optimality is thus local instead of universal as it is subject to the specificities of the environment in which the network is embedded (Gilsing, 2003:27). Nooteboom et al. (2007) explores the possibility of optimality by investigating the optimal cognitive distance and absorptive distance between parties involved in a network. They argue that these optimal distances exist in every context which may lead to the optimality interactions and innovation between the network participants. In his doctoral dissertation titled "Exploration, Exploitation and Co-evolution in Innovation Networks", Gilsing (2003) discusses the appropriate network strategies required individually for exploration and exploitation in order to foster the possibility of optimality. He further showcases that the universalistic tone of social network theorists is not appropriate when studying networks from a perspective of learning and innovation. An optimal network structure for the maximisation of innovation is determined by a combination of several network concepts, namely strength and density of ties, cognitive distance and absorptive capacity. These theorists believe that optimality in network structuring is something organisations can strive for in every context in order to improve their operations and organisational outcomes.

Based on Nooteboom and Gilsing (2004) theories on optimal network structure, the thesis investigates the opportunity of constructing an optimal innovation network according to the specific context. Even though the two concepts are analogies, they are still distinct projects.

Optimal networks structure concerns the possibility of establishing optimality in terms of a network structure in a given context. Optimal innovation structure, on the other hand, moves away from a limited network focus and aims to create an optimal innovation structure by combining the two concepts of networks and communities. These two projects still share partial similarity, as both assume that optimality is local instead of universal as it is subject to the specificities of the environment in which it is embedded. This raises the possibility that every situation has an optimal structure which best suits its operations. Just as in the case of optimal network structure, creating the optimal innovation structure within a specific scenario is very elusive, because the required structure changes throughout the lifecycle of a project. An optimal innovation structure is also determined by a combination of several network concepts, namely strength and density of ties, cognitive distance and absorptive capacity. Each scenario has an optimal combination of these network concepts which leads to the maximisation of innovation. The optimal innovation structure also requires the processes of exploration and exploitation in order to reach optimality in every context.

Consequently, it will be explored whether innovation networks are structurally equipped to promote the process of exploration based on the appropriate structure prescribed by Gilsing (2003). According to the same argument it will be explored whether communities of practice are structurally efficient to facilitate the process of exploitation. Assuming they are efficient structures the possibility of combine innovation networks and communities of practice will be investigated. Whether innovation networks and communities of practice also structurally facilitate other crucial innovation activities in the innovation process will be investigated. The aim is to explore whether combining the structural elements of both innovation networks and communities of practice may lead to an optimal innovation structure. This will allow organisations to exploit the benefits of a community of practice's strong ties together with the benefits of an innovation networks' weak ties. It is hoped that this combined innovation structure will allow organisations to improve their innovation performance in every context.

## **1.5 Research Design**

Fundamentally, innovation refers to the action of being responsive to the constant change and fluctuation common to life in general. Innovation requires creativity leading to the creation of value and development of capability which results in improved and evolved organisations and people. The desire and capacity to innovate and improve life is innate in every human being. Organisations can inhibit and suppress this desire and its capacity by implementing certain

managerial approaches based on uniformity and suppression of individuality and learning. Companies that do create enabling conditions for innovation will reap the benefits. This is exactly what separates organisations from being winners or losers in today's business environment (Pór, 2005:5). It is assumed in this thesis that innovation is critical to organisations to avoid stagnation and decline. They must institutionalise a mind-set of "innovate or die" in their operations. Employees' ability and capacity to innovate has become the sole necessity for organisations to stay relevant to their markets. It is unacceptable and tragic just how little capacity for innovation organisations today are able to evoke and sustain. This results in wasted capacity for innovation, day after day, because creative and innovative thinking is suppressed in order to keep the status quo intact. Lost innovative opportunities have a high economic and human cost for organisations which only becomes higher as time goes on. It is devastating to think that organisations might feel any reason to put up with this ever increasing waste of innovation capacity by continually implementing outdated managerial approaches, structures and processes of organising work and the learning environment.

A new generation of employees is entering the workforce and they will not accept this waste of potential. They are people who want to use their full capacity to create, innovate and make the organisation and society a better place. Their aim is to make everything more effortless, effective, efficient and, more importantly, enjoyable. Organisations might be required to learn how to keep this new type of employee interested and engaged. An environment must be created where these employees can engage in meaningful work and innovation. The organisations that fail to do that will not succeed in attracting the leaders of tomorrow (Pór, 2005:5). This is much easier said than done and I do not claim that this thesis will provide all the answers to the challenges faced in modern day business. Instead, this is an attempt to ignite investigations into the possible approaches to effectively stimulate and support innovation in the best possible ways as we move into a radically new business environment.

### **1.5.1 Research question and objectives**

There are two fields of theory, innovation networks and communities of practice, that both can be used to support and stimulate knowledge work and innovation. However, these two fields have never been brought together to see how they relate to and complement one another. In fact, in some cases they are regarded as opposing where theorists argue that the one is replacing the other in terms of supporting and stimulating knowledge work (Engeström,



2007:24). Even though some argue that communities of practice are outdated, I still believe that by combining their structural attributes with those of innovation networks, the innovation performance of organisations may be enhanced in every context.

The main purpose of this thesis is to shed light on how innovation networks and communities of practice can best be utilised to stimulate and support organisational innovation by combining their structural elements in an improved structure for innovation. The main objectives are to see how these two fields relate and complement or oppose one another on an inter-organisational level. The aim is to show that innovation networks and communities of practice can have complementary effects on learning and innovation. Even though they are distinct structures, combining the structural elements of both will allow organisations to take advantage of the benefits of both structures, while minimising their disadvantages as their innovative effects complement one another. Consequently, structurally combining elements of both innovation networks and communities of practice may allow organisations to create improved network structures which might enhance the facilitation and support of innovation and ultimately improving innovation performance in every context.

Some obstacles will need to be overcome in order to succeed in the aims and objectives of this thesis. The two separate fields of communities of practice and innovation networks will need to be brought in conversation. Relating two concepts with prominent differences might prove to be a challenge. But evaluating and comparing these two fields are needed in order to improve our understanding of structuring and stimulating innovation in and between organisations. In order to bring them together, I will need to talk about them in a common language. The most plausible common language would seem to be to use network concepts in order to discuss them as both innovation networks and communities of practice are to a certain extent networks. Using network concepts in order to explain communities of practice may prove to be a challenge as they are not pure networks and make use of their own community language. Another obstacle required to overcome relates to the fact that some theorists see these two concepts as opposing and in some cases even the one as replacing the other. Showing that this is not necessarily the case is a requirement and a major challenge to this thesis. Addressing these challenges is actually what necessitates this study.

### **1.5.2 Scope, assumptions and limitations of the research**

This section aims to give an account of the research area and the level of study. It provides a more focused and clear picture of the research scope and its limitations. As already stated, the

main objective of the thesis is to investigate how innovation networks and communities of practice relate and complement one another on an inter-organisational level. The wider purpose of the thesis is to increase the effectiveness of organisations' innovation performance by investigating how innovation networks and communities of practice as innovation structure can be used simultaneously to provide an improved platform for the facilitation and support of innovation. As a starting point, the thesis is focused on the simple assumption that innovation is normally the result of co-operation between organisations, rather than within one single organisation, as innovation is increasingly spawned in networks. Furthermore, innovation takes increasingly place in more open, global and distributed innovation environments. Another starting point is that the thesis mainly focusses on learning from the network level. That refers to the learning that takes place between partners in a network and not the learning that takes place within one organisation within the network. Learning in these networks can include the exchange of practices and processes between one another or the development of something together that is new to both of them which can be shared between multiple members in the network.

This thesis mainly focuses on learning and innovation on an inter-organisational or network level. The thesis partly takes note of learning that takes place on the organisational level and the learning and innovation that takes place in teams and groups within them. Individual level learning is however excluded from the study since it is extensively discussed in various other fields such as psychology and cognitive science (Lampela, 2009:19). Learning and innovation furthermore are regarded to take place as part of all daily operations and are not confined to specific learning events organised occasionally for that purpose. Since the thesis is based on inter-organisational learning and innovation, the research is limited to business-to-business networks with specified partners and excludes networks such as business-to-consumer networks. Learning on an organisational or inter-organisational level is made possible through long-term relationships between business-to-business partners which many be joined in a network. Even though the thesis mainly concerns the formal inter-organisational co-operation between organisations regulated by agreements, internal networks within organisations also form part of the thesis. It is assumed that internal networking for the purpose of innovation face similar kinds of challenges in learning as in inter-organisational learning. Innovation networking includes both the well-defined, goal-oriented, formal networks as well as the loosely connected, wide, informal networks. Networks are studied from the organisational level, excluding other approaches such as

macro-level studies on national or regional innovation networks. All the networks included in this thesis have a common goal, which is to create something new, either, a product, process or service. In other words their objective is to innovate.

The thesis focuses exclusively on the theoretical possibility of structurally combining the elements innovation networks and communities of practice in order to create an improved networking structure which can facilitate and support the innovative process of both these structures simultaneously. Conceptually, this may allow organisations to take advantage of the values of both structures, as well as minimise their shortcomings as their effects on learning and innovation complement one another. The delimitation of this thesis is however, showcasing how exactly these structures can be connected and combined in practice. There are several obstacles that would need to be overcome in order to answer this question, which is beyond the scope of this thesis. Building a model in order to show the many ways how these two structures can be brought together is something that needs to be tackled by future research.

### **1.5.3 Strategy and structure of the research**

The strategy for the thesis is based on two main assumptions, namely that organisations need collaboration through networking in order to innovate and that network structures may be modified according to the context in order to enhance innovation capacity and performance. Using Nooteboom and Gilsing (2004) theories on optimal network structure as a starting point, the thesis explores the possibility of creating an optimal innovation network. The attention moves beyond an exclusive network focus and aims to create an optimal innovation structure by combining the two concepts of innovation networks and communities of practice. It will be investigated whether innovation networks are structurally equipped to foster the process of exploration based on the appropriate structure prescribed by Gilsing (2003). In the same sense, it will be investigated whether communities of practice are efficient structures for the facilitation of exploitation. If they are efficient structures for the facilitation of exploration and exploitation, the possibility to structurally combine innovation networks and communities of practice will be explored. A combined structure may provide the best possible structure for the facilitation and support of both exploration and exploitation to take place simultaneously, enhancing the innovation capacity of every scenario. The possibility of innovation networks and communities of practice also structurally supporting other crucial activities, namely implementation and diffusion, in the innovation process, will be

investigated. The aim is to examine whether a combined structure of both innovation networks and communities of practice are able to lead to an optimal innovation structure.

In order to showcase how the combination of innovation networks and communities of practice can structurally enhance innovation performance, one must first unpack the structures and values of each individually, which is the focus of chapter two and three. Furthermore, it must be shown how innovation networks and communities of practice relate to one another and how these two structures relate to the three network concepts and the innovation process in general, which is the focus of chapter four. Thus, the strategy is to show that innovation networks and communities of practice correspond to the three network concepts, strength and density of ties, cognitive distance and absorptive capacity, in order to show their relevance to an optimal innovation structure. Resultantly, the relation between innovation networks and communities of practice must be shown in order to show how their effects on learning and innovation can complement one another and thus conclude that a structural combination of the two can lead to an improved network structure which may allow organisations to move closer to the optimal innovation structure in order to improve innovation performance in every context.

The thesis is structured according to five chapters, each with subsequent sections and subsections. Chapter one serves as the introduction, giving background on the thesis, how it came about and how it was executed. The first section of this chapter set the real world context in which the research is conducted. It gives an account of the knowledge economy and why studies of inter-organisational collaboration and innovation are needed in this time. The second section provides background on the concept innovation and how it is defined for the purpose of the thesis. The third section focusses on the theoretical challenges that innovation networks and communities of practice face as organisational innovative structures. It takes a look at the misconceptions that exist in both fields on a theoretical level. It concludes with an account of how these two concepts must be understood for the purpose of the thesis. The fourth section introduces the possibility of creating an optimal innovation structure by facilitating all the activities required in the innovation process based on the specific context. The last section regards the research proposition of how and why the thesis was conducted. It focuses on the research objectives, the scope, the strategy and structure, as well as the expected significance of the research.

Chapter two investigates the concept innovation networks, starting with the background on why networking is needed in today's business environment. It is argued that innovation networks are one of these networking structures which are necessitated in order to stay competitive. This is firstly illustrated by unpacking the values they may provide to organisations. Secondly, the structural elements of innovation networks are discussed in order to showcase what is required for them to thrive. Thirdly, the process of partner selection and the role of trust are discussed in order to show their relevance to the success of innovation network. Fourthly, the disadvantages and shortcomings of innovation networks are discussed in order to illustrate that they are not complete structures for the maximisation of innovation. Lastly, the critique and possible response on the theory of innovation networks will be highlighted in order to show their limitations and that they are still relevant organisational mechanisms for innovation.

Chapter three investigates Wenger's theory on community of practice. The chapter firstly provides brief backgrounds on the concept of communities of practice and Etienne Wenger. The rest of the chapter is devoted to Wenger's perspective on communities of practice, subsequently discussing his theories on the value of them for organisations, their structural elements, how they can be cultivated, inter-organisational communities of practice and their downside in general. This in-depth discussion showcases why communities of practice are valuable structure for organisations in order to facilitate and support innovation and ultimately their competitiveness in today's global business environment. The last section regards the three main lines of critique that exist on Wenger's theories and how he would possibly respond in order to show why communities of practice are still relevant as an organisational mechanism for innovation and prosperity.

Chapter four is the analysis of how innovation networks and communities of practice relate and complement one another. It showcases how they are structurally distinct, but their effects on learning and innovation can complement each other. The second section explores the innovation process and the role exploration and exploitation can play in facilitating innovation. The next section unpacks the three network concepts, namely strength and density of ties, cognitive distance and absorptive capacity, which are relevant for the creation of an optimal innovation structure. Simultaneously, the relation between innovation networks and communities of practice and these network concepts is investigated. The next section investigates the theory on optimal network structures and how an optimal innovation structure can possibly be created by combing innovation networks and communities of

practice. The last section concerns the analysis of the role of innovation networks and communities of practice in the innovation process and how they can structurally be combined in order to create an improved innovation structure, possibly leading to an optimal innovation structure depending on the context.

Chapter five is the concluding chapter which discusses the finding and implications of the thesis. Firstly, it focuses on whether the thesis has reached its goals, objectives and aims set out in the first chapter, as well as whether the research resulted in the expected significance. Thereafter reviews of chapter two, three and four follows, looking back at what we have seen in each of them. The second section summarises the complete argument put forward throughout the whole thesis. The third section provides an investigation of the limitations of the argument and the thesis as a whole. Lastly the implications of the findings of the thesis for the fields of community of practice and innovation networks, the organisation and the world in general are considered. The section consists of the theoretical implications for both the fields of innovation networks and communities of practice, as well as the practical implications for organisational management in general.

#### **1.5.4 Expected significance of the research**

It is expected that it will be shown that innovation networks and communities of practice should not be seen as competing alternatives in the innovation process, but we must rather see them as having complementary effects, correcting for one another. For innovation management this would mean that there should be a dual focus on network and community formation, facilitation and support in order to improve innovation. Theoretically, it is expected that the research will show that the structural combination of innovation networks and communities of practice may lead to an improved network structure which may enhance organisations' innovation capacity and performance. The proposal for the dual focus on network and community formation thus raises a practical question as to what extent management interventions in aid of the one structure are counter-productive for the other. The challenge for knowledge management is to promote networks in order to gain access to knowledge not available in a particular organisation as well as diffuse that knowledge throughout the network, whilst at the same time enabling communities to develop in aid of proper exploitation, small-scale diffusion and extensive implementation. The question how exactly innovation networks and communities of practice can practically be combined is beyond the scope of this thesis, one that needs to be addressed by future research.

## **CHAPTER 2**

## 2 INNOVATION NETWORKS

### 2.1 Introduction

The current competitive global business environment is characterised with high volatility, frantic competition and dynamic conditions. The business environment is demanding fundamental changes to the way organisations conduct business. Organisations are continuously forced to innovate in order to stay competitive and retain their competitive advantage (Smart et al., 2007:1071). Today successful organisations are those who constantly create new knowledge, distribute it extensively throughout their business units and rapidly embody it in new products and services. The need for knowledge acquisition and knowledge creation ultimately leading to innovation is based on the fact that knowledge has displaced land, capital and labour as the most important resources in the knowledge economy (Carlsson, 2003:194). Research has shown that novel organisational forms such as networks have been deployed to improve innovation capacity (Smart et al., 2007:1071). It has been increasingly recognised that organisations need external relationships for innovation. These relationships are required for the development of new products, production processes and learning in the creations of new competencies (Nooteboom, 2004:607). Organisations are constantly faced with large-scale problems which requires multiple organisations and institutions to join together in order to develop large-scale solutions needed to solve complex problems. Collaboration between organisations and institutions ensure that different knowledge and skills are available to meet complex challenges (Hoberecht et al., 2011:23). No single organisation has all the necessary knowledge and skills needed to solve all challenges faced in the business environment of the new economy (Powell & Grodal, 2006:59).

Networks as an organisational form are a relatively new phenomenon which only emerged in a significant way at the beginning of the 1980's. The emergence of networks as an organisational form was initially seen as an exception which will only temporarily be applicable in extraordinary scenarios. The market and hierarchical organisations were considered to be the only steady and competent forms of industrial organisations. The reality surrounding networks in business has taken all by surprise as the number of collaborative inter-organisational networks has gradually grown over the last three decades. This phenomenon has created the need for the revision of the theories on industrial organisations in order to accommodate and explain the features and role of collaboration networks in the new economy (Küppers & Pyka, 2002:76). Networks attract attention because of their ability



to provide participating organisations with access to information, resources, markets, technologies and competitive advantages. Furthermore, it may hold advantages of learning, economies of scale and the opportunity to achieve strategic objectives such as sharing risks and outsourcing organisational functions. Besides all the advantages networks hold, they do potentially possess a dark side. Networks may lock organisations into unproductive relationships or prevent them from partnering with other viable organisations. Consequently, networks can be a source of both opportunity and constraint. But the business environment of today has enhanced and to a certain degree necessitated networks as strategically important structures for organisations (Gulati et al., 2000:203).

Networks can be defined as innovative cohesive strategic alliances comprised of independent organisations, working together towards a common goal (Thrasher, 2006:16). They represent a particular form of organising exchange relations between organisations (Ebers, 1997:3), which provide organisations access to a wide stock of knowledge (Powell & Grodal, 2006:59). Networks provide organisations with the option to pool and exchange resources and cooperatively develop new knowledge and skills. Participates within networks are exposed to more experiences, different competencies and more opportunities. In the new economy the sources of knowledge are widely distributed across organisational boundaries, leaving no single organisation capable of possessing all the required skills to innovate in order to stay competitive in their markets. Networks increase the possibility of creative abrasion where synthesis is reached between multiple perspectives. Networks provide the setting, within which innovation can take place, creating the necessary knowledge for improving their competitive position (Powell & Grodal, 2006:59).

Hoberecht et al., (2011) believe that network structures are important for the success of organisations currently operating in the global business environment and still will be for future organisations. Ebers (1997:5) explains that a number of motives exist for organisations to engage in inter-organisational networks, but they ultimately come down to two main categories. Firstly, organisations engage in networking in order to increase their revenue. Networks allow participating organisations to plan against common competitors or reduce competition by establishing allies. By gaining access to complementary resources and capabilities through networks, organisations can enhance their own competitiveness, ultimately increasing their performance and revenue. Secondly, networks are also motivated by the possibility of cost reduction resulting from economies of scale and/or scope. Networking provides a fast and effective way of learning and provides a shortcut to the

process of acquiring and adopting skills. Relatedly, risk reduction forms part of cost-related motivations as networking allows organisations to spread their risk (Ebers, 1997:5). Organisations participate within networks in order to create novel knowledge and to share and employ existing knowledge to solve problems, make decisions, take actions and innovate. Not only can inter-organisational networks provide organisations with knowledge and skills which may lead to competitive advantages, but they may actually be an important source of competitive advantage itself (Carlsson, 2003:195).

Various definitions and types exist in the literature, making the comprehension of inter-organisational networks very ambiguous in practice. However, the vast amount of literature on networks seems to share some common characteristics when it comes to defining networks. Firstly, these networks are composed of organisations which are independent, operating as different organisations without common ownership (Saz-Carranza, 2007:10). Secondly, networks' existence relies primarily on negotiation and joint modifications. Thirdly, the relationships among participants are continual and stable, leading to tedious interaction. Lastly, organisations participate in these networks because they are resource interdependent, otherwise the network relationship would be redundant. Based on these communalities, networks can be broadly defined as a set of interdependent organisations, with independent managerial and decision-making activities, which negotiate and jointly adjust to each other, leading to continual and lasting relationships between organisations (Saz-Carranza, 2007:11). Different kinds of inter-organisational networks exist, but this chapter's focus is on innovation networks.

Many other networks exist between organisations, for instance for the possibility of cost-saving and economies of scale, or to gain access to new markets or resources. Innovation networks, however, exist mainly to create new ideas and implementing them in practice. Even though innovation networks may also provide similar benefits as other networks, they are additionally characterised by the strategic importance for the competitiveness and success of organisations. (Lampela, 2009:27). The formation and participation in innovation networks are mainly determined by the desire of participating organisations to gain access to knowledge assets that can facilitate further learning and knowledge creation. Innovation networks consequently require a high level of trust because of the amount of sensitive information in circulation between organisations and to deal with the uncertainty, complexity and ambiguity associated with knowledge intensive sectors. Organisations create innovation networks in order to gain access to necessary resources to improve their business models and

profiles with new products and markets. This will also consequently lead to the improvement of the organisation's role in the network itself (Lampela, 2009:28). The rest of the chapter will focus on the in-depth exploration and discussion of innovation networks in general, their value, structure, importance of partner selection, role of trust, their downside and the theoretical critique on the concept.

## **2.2 Value of Innovation Networks**

The idea of an innovation network assumes that organisations benefit from greater use of external sources of knowledge. Organisations may find it significantly easier to innovate by working with other organisations and pooling complementary resources, than trying to expand their innovative capability alone (Blackwell & Fazzina, 2008). Theorists have used many differing definition approaches in order to try and define innovation networks, but so far there is no consensus on what these networks really are. For the purpose of this chapter, innovation networks can be defined as all forms of organisations that serve the exchange of information, knowledge and other resources, leading to learning among at least three participating organisations, whose actions bring about innovation. Furthermore, these relationships should also be based on confidence and stable cooperation. Innovation networks allow innovation activities to be coordinated, where independent organisations pool their resources in order to increase their innovative potential. Innovation networks are mainly created in order to facilitate the joint development of competitive advantages (European Union, 2007:231). Successful networks derive their value from the ability to allow organisations access to resources otherwise inaccessible to them. This may include new sources for innovation, skills, markets and ideas, underlined by a sizeable cost reduction potential. These joint efforts ultimately lead to innovation in products, processes and services (European Union, 2007:230).

Innovation networks are based on the idea that knowledge creating resources have greater value by remaining independent entities and allowing these resources to be accessed across organisational boundaries and then joined and arranged in various ways, ultimately leading to enhanced innovation (Dhanaraj & Parke, 2006:662). Innovation is not only exceptional events which lead to radical inventions under specific circumstances. More often than not, innovation takes place anytime, anywhere. This type of innovation is associated with incremental inventions (Hämäläinen & Schienstock, 2000:5). The exposure to new knowledge is generally expected to increase the innovation potential of an organisation;

however the utilisation of these opportunities is by no means guaranteed (Hämäläinen & Schienstock, 2000:5). Innovation is the result of complex processes which are socially embedded and shaped and are influenced by factors such as culture, institutional setting and interests of the main role players. Ultimately, innovation is the result of an interactive, open and social process (Hämäläinen & Schienstock, 2000:5). Defining innovation as socially embedded also sheds light on its cumulative nature (Dosi, 1982:148). In this new business context, innovation is not depended on a couple of brilliant minded individuals, but depends on an organisation's internal coordination, inter-organisational cooperation and the continuous value-adding by supportive institutions. This is the same context in which innovation networks have received increasing attention and enjoy far-reaching success (Hämäläinen & Schienstock, 2000:5).

The idea surrounding innovation networks are based on the expectation that organisations will reach their goals easier and more sufficiently than they would when operating alone. It is also expected that organisations will gain immediate advantages from innovation networks. This paragraph will look at some of the most common advantages expected from participating within an innovation network. Firstly, the risk of failure of an innovative attempt is distributed among all participants and not only the burden of one (European Union, 2007: 231). They also allow the search for new ideas to be conducted by multiple partners and the innovation resultantly to be shared among those in the network (Zutshi, 2009:12). These networks allow better quality innovation targets to be reached in a shorter time frame. Networking leads to lower expenditures for innovation by each participating organisation as the cost is shared. Larger and more daring innovation initiatives can be pursued which would not be possible if organisations act individually based on the lack of material, information, personnel, skills, knowledge and financial resources. By participating in innovation networks, organisations are able to increase their strategic flexibility because of their exposure to new organisations, new members and opportunities. Lastly, innovation networks allow organisations to make better use of innovation opportunities that arise from innovative processes which are usually too much for one organisation to utilise (European Union, 2007: 231).

Innovation networks are valuable tools for fostering innovation and potentially hold many benefits for participating organisations. They may lead to an increased scale and scope of activities as different organisations collaborate within a network. The outcome of this collaboration may be the expansion of an individual organisation's customer base together

with improved performance capacity as synergies are reached between their various competencies. Furthermore, collaboration in these networks improves an organisation's ability to deal with complex challenges as they provide access to a wide range of expertise in different fields allowing organisations to continuously learn from one another. Innovation networks provide the platform for organisations to enhance their learning capacities, by not only learning about new technologies, processes and practices, but also how they may affect business in the future. As organisations work together based on collaborative research and development, each organisation is able to internalise new knowledge gained from their activities. This may increase both the efficiency and overall expenditure of each organisation's research and development. Innovation networks offer organisations flexibility in contrast to hierarchical structures normally implemented in organisations. Increased flexibility may better equip organisations to deal with the volatile business environment of today. Another advantage collaborating in an innovation network may offer is an increase in efficiency as the exchange of tacit knowledge, based on trusting relationships, enhance the operations and effectiveness of each participating organisation (Republic of Ireland, 2004:11). One of the last benefits innovation networks hold for organisations are based on speed. Networking provides organisations with increased speed in order to take advantage of opportunities that might not present itself for long. Innovation networks can provide fast responses by assembling resources and capacities to meet the challenges in a flexible manner which may not be possible in organisations acting alone. Innovation networks can especially speed up the time to market as organisations are able to exploit knowledge and capacity from other organisations which would only be possible by outsourcing in the case of an un-networked organisation (Republic of Ireland, 2004:12). O'Doherty (1998:8) classifies the benefits of networking for the purpose of innovation according to material, psychological and developmental benefits. Material benefits include the increase in sales and lower production cost which may result from working together. Psychologically organisations may benefit from networking as they will come to realise that others also share their problems. Lastly, organisations may increase their learning capacity and ability to adapt to the changing economic environment, all leading to the development of each participating organisation.

The successes of innovation networks, based on the value they provide to their members, are all about diversity. The whole concept of innovation networks is based on bringing everyone together which might provide innovative ideas regardless of departmental and organisational boundaries (Zutshi, 2009:12). Taking advantage of the power and benefits of innovation

networks require not only good management, but vision and sometimes even a shift in an organisation's corporate culture. A shift in culture and thinking may be required as organisations find it difficult to open up to innovation from external sources, or mismanaging innovation networks may lead to suboptimal success (Zutshi, 2009:12). Blackwell and Fazzina (2008) state that organisations may be required to change or shift their corporate culture and policies in order for an innovation network to work and encourage organisations to integrate innovation networks into all business activities. They believe organisations will only realise an innovation network's greatest benefit by maximising it at every level of their business activities (Blackwell & Fazzina, 2008). An organisation's culture should facilitate and support networking and the use of external knowledge as the mind-set of "not invented here" may stifle an innovation network's success (Blackwell & Fazzina, 2008). An organisation's corporate culture and perspectives may consequently be required to shift in order to accommodate the practice of innovation networks and to take full advantage of what they have to offer (Blackwell & Fazzina, 2008).

Realising the value innovation networks hold requires certain deliberate and purposeful actions by the organisations involved. One of the first tasks is to ensure that there is knowledge mobility as knowledge is dispersed throughout the network and form the main currency for innovation to take place. Knowledge mobility refers to the ease with which knowledge is shared, acquired and deployed within the network. Innovation networks will be ineffective if specialised knowledge from each organisation stays largely confined within their organisational boundaries. Successful knowledge mobility requires members to ensure that relevant knowledge residing throughout the network reach the actors where it is most needed. Ensuring knowledge mobility within a network promotes value creation, but the distribution of those values must take place equally. The second task in promoting successful innovation networks, involves managing innovation absorption within the network. Absorptive capacity is based on an environmental property which governs an organisation's ability to absorb the value generated by innovations. If organisations are unable to absorb and take advantage of the profits and opportunities created by innovation, the network will not be successful. Only creating innovative products, services and processes is not enough. Benefiting from them by internalising its values is also required in order for the innovation to serve its full use (Dhanaraj & Parke, 2006:660).

Innovation networks, in contrast to just another business trend, attempt to create and give participants access to new sources of ideas and solutions outside an organisation's boundaries.

These new sources have the potential to influence every aspect of an organisation's business activities. However, innovation networks often lack a clear definition which causes ambiguity during implementation (Blackwell & Fazzina, 2008). Innovation networks allow members to develop exactly what is needed rather than being restricted by their individual limited resources and capabilities. Furthermore, innovation networks provide members access to other's innovations which is freely shared within the network, meaning that they do not have to develop everything on their own (Von Hippel, 2002:2). This enables organisations to maximise their value by effectively combining resources from partners with their own, allowing them to exploit complementarities. Resultantly, the incorporation of outside capabilities and resources should have a positive influence on innovation achievement of both the organisation and the network as a whole (Nieto & Santamaria, 2007:368).

### **2.3 Structural Aspects of Innovation Networks**

Increasingly organisations are trying to establish innovation networks, be it for the purpose of creating completely new products or services by combining radically different knowledge, or simply to bring them together to adopt and embed innovative ideas. Organisations trying to develop these networks share the recognition that they can improve and solve innovation problems by networking (Tidd, 2006:9). Organisations that form a network all form a particular network structure where the boundaries between them are relatively porous. Organisations benefit and survive within and outside a network by forming strong connections with other organisations that hold similar, or more importantly, complementary assets (Cowan et al., 2007:1053). No matter the reasons for creating an innovation network, operating one is never easy. Innovation networks require new sets of management skills, essentially depending on the type of network and purpose it is set up to achieve (Tidd, 2006:9).

Different types of networks exist in modern times which can be differentiated according to many characteristics and elements. Firstly, networks such as innovation networks can be divided into vertical or horizontal networks. Vertical innovation networks refer to organisations which are connected along a particular value-adding chain or production process. Horizontal innovation networks are organisations connected based on a functional area or because they form part of a specific market sector or industry. Secondly, networks can be distinguished based on whether they are in the private or public sector. This refers to either networks exclusively within the private or public sector or networks stretched across

the private and public sector boundaries. Thirdly, networks can be classified according to their geographical scope as local, regional, national, international or global networks (Hämäläinen, & Schienstock, 2000:7). Fourthly, the formality of networks, especially innovation networks in this case, leads to different classifications, ranging from highly informal and flexible relations to rigid and highly formal relations. Fifthly, networks such as innovation networks normally differ based on the duration of their existence, depending on the overall functions and purpose of the network. Innovation networks may be short-lived as they dissolve after a few short-term goals are reached or they may exist to achieve an organisation's long-term objectives, continuing to exist even though sum goals have been reached.

Globalisation, combined with the rise in information technology, have liberated networks from physical proximity, lessening the need for face-to-face communication and allowing virtual networks to serve as possible alternatives based on electronic interaction. Whether a network has clear boundaries and whether they are allowed to leave the network and if others are free to join also determines how an innovation network is classified. Thus, an innovation network can be classified based on its openness and closeness to its environment. Centrality also plays a role in network classification as networks may have centralised or decentralised power structures where either one or a few organisations become dominant or all share power equal within a network. Finally, a network's stability may also vary and differentiated it from others. Innovation networks usually consist of independent organisations which have the freedom to leave the network and allow others the opportunity to join over time (Hämäläinen, & Schienstock, 2000:8). It makes the nature of innovation networks inherently unstable. But the strong relationships, based on trust which forms over time, allow networks to also form stable relations. This may give innovation networks the simultaneous characteristic of both stable and changeable structures (Hämäläinen, & Schienstock, 2000:9).

The structure of a network significantly influences and determines its effectiveness in innovative processes and innovation outcomes. Two structural characteristics of networks have a particularly important role to play in information diffusion and its innovation potential. They are respectively known as clustering and reach (Schilling & Phelps, 2007:1114). Clusters tend to form within networks as some groups of organisations tend to link more strongly with one another than with others in the wider network. Several mechanisms encourage clustering in networks such as innovation networks. The two most common mechanisms are based on similarity or complementarity between organisations. Organisations



that share some type of proximity or similarity tend to interact more intensely or frequently which results in a high degree of clustering. Clusters increase the capacity for information diffusion within an innovation network. Because the organisations within such clusters are densely connected, it allows information to quickly spread within a particular cluster. Organisations within clusters are connected by multiple pathways, enhancing the reliability of the information in circulation as it can be compared between multiple sources, highlighting its deviations and incompleteness. Clusters within innovation networks also serve as important structures for making information exchange meaningful and useful. Dense ties between organisations in a cluster increase the diffusion of alternative perspectives and develop a common understanding which stimulates collective problem solving. Internal network cluster can also increase organisations' willingness and ability to exchange information. Ultimately, clusters can give rise to trust, mutually beneficial norms and a shared identity (Schilling & Phelps, 2007:1114). This allows informal governance mechanisms to arise, facilitating collaboration which may lead to a high level of cooperation. Intense interaction among partnered organisations, based on trust; transparency; and mutually beneficial exchange, all enhance the possibility for the exchange of tacit or embedded knowledge. Clustering thus enables richer and greater information and knowledge exchange to take place. When these clusters within a network become connected, it provides the necessary requisite variety of knowledge needed for knowledge creation (Schilling & Phelps, 2007:1115).

Clustering, besides the potential value it holds, usually involve many redundant ties between the same organisations. It can also create standards and norms which may limit the amount of experimentation and creativity within innovation networks. These consequences can ultimately limit innovation, the reason for the existence of innovation networks. But redundant paths also provide access to heterogeneous perspectives, information and knowledge which supply innovation networks with requisite variety for recombination into new innovations (Schilling & Phelps, 2007:1115). Clustering offers both local and global advantages as organisations benefit from both redundant ties among their immediate partners and being embedded within a larger network. Redundant ties enhance the speed and likelihood of information access as well as the depth of information interpretation. On the other hand, information from organisations in other clusters is more likely to be complete and richly understood than from others not embedded within a cluster. It also provides access to

diverse information, enhancing the recombination possibilities and ultimately the innovation possibility of the network (Schilling & Phelps, 2007:1115).

The overall size of a network and its average path length also impacts information diffusion and novel recombination. The average path length refers to the average number of links that separates each pair of organisations in the network. The more organisations can be reached by one path, the more knowledge the specific organisation can potentially access (Schilling & Phelps, 2007:1115). Logically, information and knowledge can more rapidly diffuse in networks with short rather than longer average path lengths. An organisation that is connected to a large amount of organisations by a short average path will be able to reach more information, more quickly and with less risk of distortion, than organisations connected to less organisations with larger path lengths. Forming clusters within an innovation network is costly, forcing a trade-off between forming dense structures or short path links between greater amounts of organisations. It's a trade-off between facilitating rapid exchange and integration of knowledge versus having access to diverse perspectives, information and knowledge. More recent research has shown that networks can provide both these advantages simultaneously by fostering strong clusters with a number of links between them serving as bridges. Bridges allow diverse information and knowledge to circulate between different clusters within a network, which facilitates the existence of clusters as oppose to causing a trade-off (Schilling & Phelps, 2007:1115). Bridges ensure that novel information and knowledge are spread, leading to new combinations of existing knowledge sets. This combination of both clustering and reach enables a wide range of information to be exchanged and integrated, leading to greater knowledge creation (Schilling & Phelps, 2007:1116).

Researchers have over the years given different answers on how network formation takes place, but most suggest it consists of similar developmental phases. Larson (1992:82) distinguishes between a pre-networking phase where preconditions for establishing relationships are formulated; a second phase where the conditions for interaction are laid down; and a final phase in which the networking relationships solidifies. Researchers such as Gray (1987:913) and Snow and Thomas (1993) have all distinguished between similar three phases with slight variations. Each phase have certain contingencies that facilitates and constrain the full completion of each phase (Ebers, 1997:7). Larson (1992:84) states that personal reputation, prior relation and an organisation's reputation all form a large part of the preconditions for networking. She also mentioned that building a network relationship is

highly dependent on whether there is a perceived mutual economic advantage, an established trail period and at least one party taking the lead. She has found that networking will only be successful when some sort of operational and strategic integration takes place between the parties involved. Gray (1987:914) focuses on the role of slightly different aspects such as the importance of interdependence among the organisations, shared legitimacy and power.

Besides all its diversity, variation and forms, researchers, practitioners and members generally agree on one thing regarding innovation networks and that is that they are difficult structures to form and manage. Justifying the effort needed to develop and manage an innovation network requires high and far-reaching benefits, out-weighing the costs and efforts (Hoberecht et al., 2011:24). Success depends on whether the participating actors can effectively work together with clear intentions to collaborate. This will allow organisations to put the necessary infrastructures and competencies in place in order to support the developing initiatives. Promoting collaborative behaviour and creating an enabling environment for it is essential for supporting innovation networks. This will help support and facilitate the creation of a shared vision, trusting relationships, balanced power and authority, clearly defined roles and responsibilities and the ultimate perceived success of the network (Hoberecht et al., 2011:24). In order for organisations to manage their innovation networks strategically, they require a certain set of capabilities, which Capaldo (2007:585) terms “relational capabilities”. The most important capability is to sustain the network’s innovativeness by creating and managing the network’s overall structure (Capaldo, 2007:585). It is widely accepted that diversity in ties increase the potential to generate innovation. However, there is a limit to the amount of diversity, as Burt (1992:8) argues that these diverse ties should still be non-redundant ties. Consequently an innovation network should only have a certain number of ties to minimize redundancy (Capaldo, 2007:587). Effectively managing network initiatives, such as innovation networks, has proven to be a challenge in the new economy, requiring organisations to develop specific managerial and soft skills. One of these skills is to select the best possible partners when initiating networking collaboration with other organisations. Successful partner selection within innovation networks is the focus of the next section.

## **2.4 Partner Selection for Innovation Networks**

The successful development of an innovation network depends above all on the appropriate selection of partners and the establishment of the relations which they must form towards one

another (European Union, 2007: 233). The process of selecting the most suitable partners for innovation network formation is crucial. The type of partners selected can determine how the network is managed and what kind of innovation can be achieved. Depending on the specific characteristics, objectives and motives of each possible partner will largely lead to the innovation network achieving different results. Traditionally, selecting a partner is done by weighing the possible risks against expected results and outcomes (Nieto & Santamaria, 2007:369).

When forming innovation networks, organisations usually turn to their current business partners as the relationships between them are already established and the administration cost is lower than establishing new relations. Subconsciously, organisations tend to select existing business partners which are smaller than they are. Smaller organisations may lack resources to exploit and may have insufficient market presence or resources to contribute successfully to the network (Blackwell & Fazzina, 2008). Organisations aspiring to create innovation networks are rather encouraged to look at larger, more powerful and resourceful, business partners that possess the necessary technical and market research resources which are required in innovation networks. Larger business partners tend to think more ambitiously, increasing the probability for discovering and producing ground-breaking innovation. Partnering with large business partners also possibly hold a dark side as they may be more inclined to act opportunistically, using ideas and resources for their own personal benefit. For that reason intellectual property issues should be addressed before the innovation network is established. Larger partners also possess more power in the market and industry, giving them a better chance to assume a dominant power position within the innovation network. For this reason, organisations should select business partners they can trust, with a good reputation, as those partners are usually the ones that act with the mutual benefit of the network in mind (Blackwell & Fazzina, 2008).

Examples of existing business partners are the organisation's current suppliers and its customers. Incorporating existing suppliers within an innovation network require specific managerial needs as they tend to be resistant to other network partners, seeing them as possible threats to their embedded relationships. Suppliers tend to be reluctant to others efforts in order to address critical problems as they have worked hard over the years to become a preferred supplier to a specific company (Blackwell & Fazzina, 2008). Because suppliers will have a massive impact on the success of innovation networks, it creates the need to establish their commitment to the network beforehand. One way to do this is by

creating explicit network objectives, a mission statement and a framework for how they can contribute, together with an insistence that they continuously conform. Customer needs and inputs in terms of product and service development are important to the success of innovation networks as well as satisfying those customer needs. Organisations can incorporate customers in innovation networks by means of user conferences, customer advisory boards, product contests, blog sites, product support web sites and consumer surveys (Blackwell & Fazzina, 2008).

Selecting partners for innovation networks based on imperfect information regarding their capabilities, reliability and motives creates considerable risk. One way of mitigating these risks is by selecting organisations with which an organisation has had ties in the past, or consulting a trusted third party which may provide information on a candidate's reputation. For that exact reason, organisations tend to collaborate with past partners with which they are familiar and share a degree of trust (Baum et al., 2010:2094). Referrals from trusted partners to other possible partners are also a powerful mechanism used in the screening process. The attractiveness between an organisation and potential partners are usually mediated by the similarity or complementarity of their current knowledge and competencies (Baum et al., 2010:2095). Organisations with shared interest and common environmental pressure facilitate the formation of familiarity and build trust, allowing them to become potential network partners (Schön & Pyka, 2012:7). These factors in turn moderate opportunistic behaviour and facilitate collaboration (Uzzi, 1997:45). Organisations which are too similar, meaning their knowledge overlap too much, leaves very little to be learned from each other. On the other hand, if organisations are too dissimilar, meaning they have very little knowledge overlap, will lead to difficulty in understanding each other. When partners are selected based on complementary knowledge profiles, the partnership will cause them to become more similar over time as knowledge is exchanged. Becoming too similar will make the partnership less attractive as they will have too little to learn from one another. Resultantly, there is a balance between selecting partners which is similar or dissimilar as both holds its advantages up to a certain point (Baum et al., 2010:2096).

Blackwell and Fazzina (2008) believe that innovation network partners should be selected for every product lifecycle phase. According to them, each phase requires certain partners in order to improve innovation and the ultimate performance of the organisations involved and the network in general. They prescribe different partners, depending on the lifecycle phase, ranging from ideation consultants, embedded suppliers, other innovation networks, customers,

other existing business partners and channel partners. Blackwell and Fazzina (2008) also state that innovation strategies vary greatly depending on the innovation network's environment and circumstances. The strategy depends on the markets in which it participate, the technologies they produce or are dependent upon, competition pressures and the size of organisations involved and the network as a whole. Their surveys have shown that the larger the organisation and the network, the more likely it is to leverage innovation.

Partner selection is ultimately a combination between building and working with a significantly different set of partners than organisations are accustomed to and maintaining the strong existing relationships with prior and regular partner organisations. Both these type of relationships between partners are important for continuous innovation, as new relationships are inclined to produce novel ideas and innovations and strong ties enable a steady stream of continuous incremental innovation. Innovation networks consequently require the selection and formation of a diverse set of partners, consisting of both new and existing relationships (Tidd, 2006:7).

## **2.5 Role of trust in Innovation Networks**

Innovation networks consist of various, differing and unequal organisations based on maturity, strength of their business models and staff. Each participating organisation may have dramatically different priorities and reasons for joining an innovation network. Consequently, risk is asymmetrically spread across the network as organisations are unequal in size, capacity and capabilities paired with their differing incentives and strategies (Skardon, 2011:86). Trusting relationships within innovation networks are important for many reasons. Creating trust within innovation networks hold the benefits of reduced transaction costs, risk and it is crucial for the maintenance of long-term relations. Trust within innovation networks can be extremely complex as it is dependent on both personal characteristics of key individuals involved as well as relationships between the organisations involved (Skardon, 2011:86).

Establishing trusting relationships within innovation networks is a multi-faceted problem. Every organisation must firstly be convinced to join the network and commit to its objectives by providing all the required resources needed to make the network a success. Each organisation, no matter what the size, role, or importance is required to fulfil their part. The mutual commitment by all participants will foster trusting relationships and support between the various and differing organisations (Skardon, 2011:87). Mayer et al. (1995:712) referred

to trust as the willingness for someone to be vulnerable. This relates closely to how trustworthiness can be perceived as that quality of someone that makes one willing to be vulnerable. A general agreement exist in the trust literature that trusting relationships lead to greater knowledge exchange between networking parties. This is credited to people's willingness to exchange useful knowledge as well as listen to and absorb it when high levels of trust exist. The transaction cost of knowledge between parties is also less when they share high levels of trust. These effects of trust have been empirically supported at the individual and organisational levels in various settings (Levin & Cross, 2004:1482).

Networks consist of ties between participants with varying strengths. The strength of interaction between organisations has implications for trust and trustworthiness. Close relationships, based on frequent interaction, allow organisations to get to know each other, share important information and create a common understanding (Tsai & Ghoshal, 1998:465). High levels of trust are more commonly associated with strong ties between individuals and organisations, but the two concepts are not synonyms for each other. Trust is more likely to develop between parties which are strongly connected, but it is not necessitated as strong working relationships may lack high levels of trust. In fact, weak ties may also be characterised by high levels of trust, even though the parties may be regarded as so-called strangers (Levin & Cross, 2004:1482). Trust, combined with the reputation of trustworthiness, is also important for weak ties, due to the limited feasibility of contractual control and lack of hierarchy in such network relationships (Gilsing & Nooteboom, 2005:7). This type of trust is based on mutual respect, common dependence and reputation in order to make it work among individuals and organisations struggling with shared problems (Gilsing & Nooteboom, 2005:12). Consequently, the possibility of four types of trust exists based on the combination of the strength of ties and the level of trust. Strong ties may be characterised with either high or low levels of trust, but strong ties are most commonly associated with a fair amount of trust. Weak ties may also be associated with either low or high levels of trust, even though the former is more commonly witnessed in practice (Levin & Cross, 2004:1482).

The importance of trust in relationships, including innovation network relations, is dependent on the type of knowledge transferred. It is generally believed that high levels of trust are required when tacit knowledge needs to be exchanged, as knowledge seekers must trust that the knowledge sources are competent and trustworthy. On the other hand, trust, or high levels at least, is not necessarily required when knowledge is codified (Levin & Cross, 2004:1487). Normally, trusting relationships are brought together and maintained by common norms,

goals, values, a shared language and mutual understanding. These factors are largely influenced and determined by the overall network structure (Schön & Pyka, 2012:13). Organisations with similar or common values with a shared vision may encourage them to develop trusting relationships. A shared vision, based on the same perceptions about how to interact, supports the relations between one another, lessening the chances for misunderstandings and improves opportunities for exchanges to take place more freely. In this sense, organisations that share a similar vision are more likely to establish relations which lead to the formation of networks. A shared vision serves as a bounding mechanism which leads to the formation of innovation networks as well as the maintenance of these structures (Tsai & Ghoshal, 1998:467).

Opportunistic behaviour may be erased if a harmony of interests exist, based on common values and beliefs. Innovation network members are inclined to trust one another if collective goals and values exist, leading to the belief that they all work together in order to reach common objectives and not operate based on self-interest. Interaction is the main vehicle which shapes common goals and values as well as defuses them throughout the network. A shared vision is ultimately determined by social interactions between network members (Tsai & Ghoshal, 1998:466). Interactions help members to learn the network's values and adopt its languages, standards and practices. Social interactions within a network create channels for information and resource sharing to take place. It allows members to cross organisational and departmental boundaries in order to acquire what they need (Tsai & Ghoshal, 1998:467).

The existence of trust between partners in a network does not guarantee knowledge transfer, but definitely increases the possibility that it will take place (Simard & West, 2006:26). Trust between participants increases the likelihood of and willingness to share resources, seeing that they believe they will not be taken advantage of. Cooperation, based on the exchange or recombination of resources, is thus more likely to take place where trust exists. As relationships based on trust are being developed within an innovation network, members start building a reputation of trustworthiness. These reputations become extremely important for participating organisations and serve as information for others in the future about an organisation's trustworthiness. A reputation of trustworthiness, will allow an organisation to form more and stronger exchange relationships with others, improving innovation potential. Thus, trustworthiness may be associated with increased resource exchange and resultantly increase innovation (Tsai & Ghoshal, 1998:467).



## 2.6 Downside of Innovation Networks

Establishing innovation networks have proved to be much more challenging than it sounds in theory. Of organisations that have succeeded in developing innovation networks, few can actually justify their existence with concrete results and outcomes. Certain factors have been given as explanation for these limited results. “Not-invented-here” syndrome is still a common sight in organisations today. This happens when an organisation’s corporate culture discourages the use of externally developed products, procedures, practices and knowledge. Poor management focuses and the failure to promote or approve external cooperation is also counterproductive to an innovation network’s success (Blackwell & Fazzina, 2008). Organisations that lack the proper processes for finding and leveraging external resources will be limited in their innovative success. These shortcomings illustrate a degree of disconnection between the theory on innovation networks and the actual implementation and execution of them in practice (Blackwell & Fazzina, 2008).

Despite all the possible advantages organisations may gain access to, the possible disadvantages must also be considered before entering into any network (European Union, 2007:231). Firstly, problems may arise based on the rights to utilise the innovation results. All participants must benefit and agree on the way certain innovation outcomes will be shared or distributed. These types of agreements must be made clear in the contractual agreement before-hand. Certain innovation advantages specific to an organisation may be required to be given up partly as they are diffused among participating organisations, making the exclusive use of them no longer available. In this sense organisations may lose some of their innovation advantages they currently have in search of more and/or greater advantages within a network. As long as the possible gains outweigh these losses, organisations will continue to participate within a specific innovation network (European Union, 2007:232). Mutual or single dependency becomes a real threat when cooperating within an innovation network. Organisations become incapable of carrying out innovation projects without the help of other organisations or the disposability of their resources within the network. These dependencies may jeopardise organisations’ abilities to innovate independently outside the network, especially causing concern in the future when the innovation network may no longer exist. This may have a negative effect on the long-term survival of the organisation as its innovative capacity slowly decays. Lastly, participating within an innovation network may cause organisations to become too focused on what the network needs, resultantly neglecting their own needs and requirements. Organisations became more concerned with the core

competencies required in the network that they risk losing their own competencies in the long run (European Union, 2007:232).

Many so-called innovation networks exist only to operate as marketing alliances. Innovation networks must go beyond joint marketing and sales activities. A true innovation network only exists when organisations collaboratively develop innovative intellectual properties and spread it throughout the network so that it can be shared with or sold to network members' partners and customers (Zutshi, 2009:12). Some innovation networks fail to set a broad and inclusive agenda only focusing on single domains. Proper innovation networks go beyond the basics of the industry context in order to include multiple domains and industries. Innovation networks also fail to realise their potential in terms of innovation. They must strive for the highest level of innovation possible, seeing that new business models and new products and services provide a competitive advantage. In the end, business leaders are looking for breakthrough innovation above all, requiring the network to be continuously focused and structured to reach the highest level of innovation (Zutshi, 2009:12).

Collaboration in innovation networks through joint research and development may hold certain disadvantages mainly caused by transaction cost. Coordinating, managing and controlling the network activities can be especially costly. Asymmetric information, possible opportunistic behaviour and uncertainty about the absorption of the value produced by innovations are all related costs which need to be taken into account (Nieto & Santamaria, 2007:369). Innovation networks are also susceptible to many of the well-known institutional problems which may have an impact on trust within the network. Problems such as principle-agent, adverse selection, knowledge asymmetry and free-riding can be a common site if innovation networks are not adequately established or maintained. Innovation networks, as all organisational forms, are susceptible to internal politics. Organisations can use their resources and importance as leverage to try and influence network decision-making in their favour or to the expense of others. That is why selecting the correct partners is such an important process. Inadequate partner selection and inefficient rule enforcement create the opportunity for free riding by participating organisations (Skardon, 2011:86). Making use of an organisation's social and professional networks may be extremely valuable when trying to find the best possible candidates to form an innovation network based on trust. Another way to ensure trusting relationships are formed is by developing a shared and corresponding level of expectations. This is another reason why the screening and selecting processes are so

important, ensuring that organisations are a good match, ultimately increasing the possibility for trusting relations to develop (Skardon, 2011:88).

## **2.7 Critique on the theory and practice of Innovation Networks**

The massive interest in innovation networks over the last two decades has given rise to a vast amount of academic research in the field. Researchers from numerous fields have engaged in continuous investigations in theoretical, methodological or empirical studies. However, despite the amount of research, no consensus exists among academics on various issues regarding innovation networks. Two of the main topics of debate regard the spatial or geographical boundaries of an innovation network and the nature and intensity of interaction between the actors involved (Hamdouch, 2007:2). What makes matters even worse is the fact that different disciplines theorising about innovation networks are not able to integrate their converging and complementary insights which may enhance our understanding of the concept all together. This so-called “disciplinary segregation” creates a blurred picture of innovation networks as various social sciences form their own isolated perspectives leading to theoretical and practical confusion (Hamdouch, 2007:2).

The academic interest in innovation networks are also accompanied by governmental and international organisational support based on the belief that networking may improve national competitiveness in a global economy. Consequently, vast amounts of funding have gone into academic research on the concept of clustering and innovation networks in order to improve the understanding around their working (Hamdouch, 2007:2). Despite all the effort, major issues are still sharply debated in the field of innovation networks. The definitions of what really constitute a cluster, innovation cluster or innovation networks have no consensual answers. The same goes for their spatial or geographical boundaries and the conditions for their emergences and development. The literature is filled with various analytical, theoretical and methodological approaches to attempt to clarify these concepts, only highlighting the disciplinary segregation evident in the field’s current research (Hamdouch, 2007:2).

The literature is cluttered with different definitions of what an innovation network might be. Even though some of these differences may be marginal, it causes the notion to be theoretically fuzzy. Furthermore, a debate on spatial or geographical boundaries and proximity exist where some believe that physical proximity has become less important and others more important in today’s globalised world (Hamdouch, 2007:3). The evolution of globalisation, together with the rise of information technology, creation of borderless markets,

the hypermobility of finance and the rise of transnational organisations have signalled to some theorists the end of the importance of geography and proximity, while others believe that globalisation have in fact increased the importance of location. Porter (1998:90), being one of the latter theorists, argue that competitive advantage in the global economy is more often than not depended on localisation, arising from concentrations of specialised information and knowledge.

On the one hand, it is agreed that the exchange of codified knowledge between spatially dispersed organisations are a lot easier and important in the global economy. The exchanges are made possible by clusters or networks which are considered to be open as interactions, facilitated by information technology tools, take place between partners located in various distant areas. Open networks are especially required when the aim is to produce innovations based on the logic of exploration (Hamdouch, 2007:8). However, the exchange of tacit knowledge between distant partners, even virtually, will prove difficult. The nature of tacit knowledge requires spatial proximity and physical interaction at least to some degree (Dahl & Pedersen, 2004:1677). It requires a minimum of direct or physical contact between actors in the past which initiate mutual recognition of potential partners and the establishment of trust and trustworthiness for future relations. Even if certain exchanges between physically distant actors is possible, no organisation will exchange anything without knowing where the actor is located and is satisfied with that location (Hamdouch, 2007:8). Consequently, the geographical identity of an organisation matters, especially when crucial knowledge needs to be shared. This illustrates that organisations do not necessarily need to be co-located and can be dispersed in multiple territories over several regions or even countries (Hamdouch, 2007:9). Some refer to such innovation networks as global innovation networks which reflect the increasing internationalisation of research and development activities of organisations (Ernst, 2006:3).

Clearly the field of innovation networks still remains rather ambiguous and in need of some synthesising and clarification efforts, even though the various perspectives and insights of its key features have been valuable. This is illustrated by the fact that some crucial issues still remain unsolved and lack sufficient empirical support. Martin and Sunley (2003) consequently explore the possibility that innovation networks and clusters may only be a conceptual illusion and not a universal remedy. The mere popularity of the concept of innovation networks in recent times, does not guarantee its profoundness or the success during application in practice. Their critique on innovation networks and clusters are based

on the argument that there is still much about the concept which is problematic and that its application in practice has been done too hastily as its fundamental conceptual, theoretical and empirical state is still found wanting (Martin & Sunley, 2003:5). Martin and Sunley (2003:12) emphasise the vague and multidimensional character of the concepts cluster and innovation network which causes problems of defining and conducting theoretical and empirical investigations. Furthermore, it is hard to identify clusters and innovation networks as they have been used differently by theorists in order to suit their various and specific purposes (Martin & Sunley, 2003:12). One thing all scholars agree on is that clusters and innovation networks vary considerably in type, origins, structure, coordination, development and dynamics, but theorists such as Porter (1998) have attempted to create an umbrella definition which supposedly fits all (Martin & Sunley, 2003:22). Thus, one of the main sources of confusion is that of its definition as no consensus exists surrounding this seemingly fuzzy concept. Definitions have attempted to recognise the diversity of an innovation network's possible form, size, and stage of development and scope which may exist, but they believe that it only succeeded in highlighting its seemingly chaotic character (Martin & Sunley, 2003:18).

Martin and Sunley (2003:34) points out the fact that empirical studies on innovation networks and clusters have not validated the improved performance and advantages they promise in theory. This causes uncertainty surrounding the rise in productivity, innovativeness, competitiveness and profitability claims for organisations and a national economy that is used to propagate and justify the investment in innovation networks and clusters. Without sufficient empirical evidence validating the possible benefits of networking and clustering for innovation purposes, it can only be justified in theory and is thus invaluable to organisations (Martin & Sunley, 2003:34). However, empirical evidence has been found in support of innovation networks and clusters in specific and certain industries, during certain phases of development and under particular conditions. This means that possible validation of the benefits and justification of innovation networks does exist, but these results can currently not be generalised to include every context (Martin & Sunley, 2003:36). The unresolved debate surrounding how the boundaries of clusters and innovation networks must be correctly and appropriately specified and measured, allows scholars to question or reject empirical evidence which may not support the implementation or success of these concepts. Consequently, it is impossible to reject innovation networks based on empirical evidence as there are so many ambiguities, defining problems, exceptions and special cases. These

ambiguities must first be removed before theorists can state that innovation networks are definitively proven or rejected in practice (Martin & Sunley, 2003:37).

Martin and Sunley (2003:37) argue that given the little amount of empirical studies which conclusively showcase that clustering and innovation networks produce the benefits proclaimed in theory, the massive interest and popularity the concepts enjoy must be explained and justified. The reason for the popularity of clusters and networks they believe is because organisations and governments seek safety in numbers, to share the cost and risk of our ambiguous future (Martin & Sunley, 2003:42). They focus on the many cases and studies which highlight the possibility that a cluster or network framework may either be unnecessary or even constraining (Martin & Sunley, 2003:39). Only focusing on the potential benefits of clustering and networking may cause one to ignore important potential dangers. Martin and Sunley (2003:43) state, quite logically, that the advantages of innovation networks and clusters may be over-generalised, ignoring other factors which may determine the success of networking and clustering policies. Organisations must keep in mind that factors such as management, culture and practice play a prominent role in facilitating the success of networking and clustering as they clearly do not operate independently. As long as organisations realise this interdependence and attempt to support and facilitate its operations, innovation networks can still possibly provide the benefits they hold (Martin & Sunley, 2003:43).

Martin and Sunley (2003:44) continue their criticism on clustering and networking by focusing on one of the possible downsides. Working together with other organisations or governments may lead to the establishment of certain ways of thinking and doing things. This may cause networks or clusters to become locked-in on their established processes and practices leading to possible stagnation as their ways become outdated. Networks and clusters which rely on physical interaction and the exchange of tacit knowledge, as in the case of some innovation networks, is particularly vulnerable to lock-in (Martin & Sunley, 2003:44). Lock-in can be avoided if networks and clusters continuously revise their ways of doing through renegotiation and consolidation. Allowing new members to enter and old ones to leave will ensure that fresh perspectives are taken into account which may challenge the established norms and status quo. Martin and Sunley (2003:49) concludes their critique by stating that clustering and networking may enjoy their massive interest based on the image or brand created around them by theorists such as Porter (1998). They explore the possibility that clusters and networks may only be a fashionable idea which has become popular as a

result of clever positioning and marketing. Based on all the uncertainty and doubt surrounding these concepts, Martin and Sunley (2003:49) state that just as other fashionable ideas, these two will also become unfashionable in due time.

Another vigorously debated topic in the literature concerns the forces that drive the formation and sustainability of innovation clusters or innovation networks. The two opposing arguments look at network or cluster formation as either spontaneous or political. Some see network or cluster formation as self-organising as it stem from a deterministic chaos or even by change. Alternatively, others believe that it is the result of designed creation based on strong strategic or political will. The truth however is a hybrid between the two as it is the result of an array of various mechanisms, ranging from decentralised, self-organising dynamics to more centralised actions and policies (Hamdouch, 2007:18). One cannot simply decide to create an innovation network from scratch, but one must rather put the correct incentives and coordination mechanisms in place to facilitate its creation which is determined by various explicit or implicit factors. Resultantly, the formation and sustainability of innovation networks are drawn by both invisible hands as well as by visible hands (Hamdouch, 2007:19).

It can be seen throughout this section that the notion of innovation networks is not as positive as one may expect. The literature is far from being integrated and grounded in solid analytical frameworks. Crucial debates are also still pending on topics such as the spatial or geographical scaling of clusters and innovation networks and the nature and forms of interaction that takes place within such networks. Our comprehension of the underlying forces and mechanisms which determine the emergence, formation and development of innovation networks is lacking, to say the least. Furthermore, the theoretical and analytical grounds of innovation networks are also partial, fragmented and rather fragile. This goes not mean that the concepts of clustering and innovation networks need to be discarded. Rather the theory and practice of innovation networks can be improved through robust efforts towards enhanced conceptualisation and analytical work. The disciplinary segregation that exists in the field can also be removed by overcoming cross-disciplinary boundaries. Research from different fields is rather complementary and even converging, especially based on the literature regarding actor relationships and network structures (Hamdouch, 2007:25). Hamdouch (2007:26) believes that only through such efforts towards improved analytical grounding, combined with a robust interdisciplinary integration, can scholars prove that innovation networks and clusters are not illusions, but are in fact real structuring forces of innovation and prosperity.

## 2.8 Conclusion

After looking at the downside of and critique on the theory and practice of innovation networks, one cannot help but to ask whether it is worth studying and expanding the concept further. Irrespective of its downsides, innovation networks and networks in general are the only tools which allow organisations to search and discover novel knowledge. These networks usually consist of weak ties between several heterogeneous organisations providing them access to knowledge which might have been inaccessible otherwise. Innovation networks promote diversity in foci and perspectives, making them highly equipped for the exploration of new knowledge. It's the ability to explore and discover new ideas and knowledge which necessitates innovation networks, irrespective of their shortcomings. Furthermore, innovation networks, as most networks in general, are structurally efficient in diffusing information and knowledge. Large-scale diffusion is facilitated by innovation networks throughout all the partner organisations involved. Besides the advantages of being the only tool to find novel knowledge, innovation networks are not able to support the utilisation and absorption of new knowledge. They are also not sufficiently equipped to help with the implementation of novel knowledge and innovation. These activities are necessary for newfound knowledge to be internalised and exploited in order for innovation to take place. Organisations cannot only come up with new ideas and discover new knowledge, but require the actual utilisation of them in order to realise their productive potential. Other structures are more equipped for the exploitation, implementation and to some extent even the diffusion of novel knowledge and innovation. The focus turns to one of these structures in the next chapter, namely communities of practice.



## **CHAPTER 3**

## 3 COMMUNITIES OF PRACTICE

### 3.1 Introduction

The term community of practice has only recently been coined to refer to an age-old phenomenon going as far back as ancient times. The term was first introduced in Lave and Wenger's (1991) book titled "Situated learning: legitimate peripheral participation" in 1991. However, today's communities of practice differ from the ones observed in the past in one important aspect. Instead of being composed of people working on their own they often exist within large organisations (Wenger & Snyder, 2000:140). People and organisations are increasingly taking notice of communities of practice and how they can serve as a key to improving performance. In this chapter the concept of community of practice is examined through Etienne Wenger's perspective. Etienne Wenger, Ph.D. researcher, author and consultant, is a recognised pioneer and thought leader in the field of communities of practice and social learning theory. His theories is used throughout the chapter to explain what communities of practice are and why they are useful as an approach to knowing and learning (Kahan, 2004:27).

According to Wenger et al. (2002:3), communities of practice are "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an on-going basis". People in communities of practice meet because they find value in their interaction and not necessarily because they work together. People in these communities share information, ideas, advice and insights with one another. These exchanges might help participants to solve the problems they are facing in their daily lives (Wenger et al., 2002:4). Not all communities can be considered communities of practice, but must satisfy three main requirements. Firstly, it must commit to a domain. A domain is a statement of the knowledge the community will steward, a commitment to take responsibility for an area of expertise (Wenger et al., 2002:32). Secondly, a sense of community must be established through interpersonal relationships so that members can effectively interact and work together (Wenger et al., 2002:34). Lastly, a shared practice must be developed over time. It is the shared body of knowledge that creates a common foundation in order for members to effectively work together. The shared practice supports innovation, by providing a body of knowledge and a common language regarding that practice that community rely on for mutual understanding (Wenger et al., 2002:38).

The interactions between people in communities of practice consist of discussions over each individual's situations and aspirations as well as needs. Together they debate common issues, contemplate ideas and act as sounding boards (Wenger et al., 2002:4). Through their interactions, members accumulate knowledge and become informally bound by their learning experience. As time passes, they develop a particular perspective on their topic, together with a body of common knowledge, practices and approaches (Wenger et al., 2002:5). According to Wenger et al. (2002:5), communities of practice are everywhere, starting at home, at school, at work and even in our hobbies. Although the name for them may differ, some even remain unnamed, they are everywhere in our lives, we might not even recognise them. In some we are core participants and other occasional participants, but Wenger et al. (2002:5) believe that most of us are familiar with the experience of belonging to a community of practice.

### **3.2 Communities of Practice and Their Value to Organisations**

Communities of practice are a natural part of organisational life. They depend on the voluntary participation and engagement of members as well as internal leadership emerging over time. They develop on their own irrespective of whether the organisation recognises them. It is in fact their informality and autonomy which allow them to steward knowledge (Wenger et al., 2002:12). According to Wenger (2001:40), communities of practice' strengths lie in their "ability to drive strategy, generate new businesses, solve problems, promote the spread of best practices, develop people's professional skills, and help companies recruit and retain talented workers". As communities generate knowledge, they reinforce and renew themselves, causing them to be self-perpetuating (Wenger & Snyder, 2000:143). Organisations should have the correct perceptions of communities of practice in order to appreciate the value they create. Communities of practice are not a simple solution to all the problems an organisation may face. They are also not intended to take over the functions of teams and business units in the organisation seeing that they are not established to serve markets and deliver products and services (Wenger et al., 2002:14). Organisations must fully understand communities of practice's role in stewarding knowledge and recognise them as one of the primary contributors to success in the knowledge economy. Communities of practice are not merely there to manage knowledge in organisations, but in fact they create value in multiple and complex ways for both their members and the organisation. The rest of this section will focus on the different ways in which communities of practice may add value to the organisation (Wenger et al., 2002:15).

### 3.2.1 Short-Term and Long-Term Value

Communities of practice hold both short and long-term value for its members and the organisation as a whole. Short-term value is created for members participating in these communities seeing that they have access to immediate expertise which can help them with daily challenges (Wenger et al., 2002:15). Inevitably in these communities, members start sharing their experiences and knowledge in free-flowing, creative ways. It created the potential to foster new approaches to problem solving (Wenger, 2001:40). This provides employees with the opportunity to expand their own skills and expertise, increasing their marketability and employability, ultimately enhancing each one's professional reputation. Continuous interactions between knowledgeable individuals within these communities lead to improved personal and organisational capabilities, where the emergence of unplanned capabilities is not uncommon as a result (Wenger et al., 2002:16). Interaction between members means that less time is spend on searching for information or solutions. For the organisations this means a reduction in time and costs. By taking account of other members' perspectives, better solutions are formulated which ultimately leads to better decision-making. Members of communities of practice can take these learned experiences to teams and business units with which they are involved on a daily basis, allowing them to better contribute to those structures. This can lead to coordination, standardisation and synergies across an organisation's business units. People participating in communities of practice will become more daring in taking risks or trying new things as they become confident in their approaches to problems, knowing that they have their community's support. These communities can even collaborate across organisational boundaries, where thus efforts can lead to synergies between communities of practice on an inter-organisational basis (Wenger et al., 2002:15).

Internally communities of practice address immediate problems together, leading to the building of sustained value by developing an on-going practice that will serve the organisation's long-term strategy. In effect, they are accumulating their experience in a knowledge base which can have a positive impact throughout the organisation (Wenger et al., 2002:15). Communities of practice will over time provide capacity for knowledge-development projects to take place in organisations. On an inter-organisational scale, this can in the long run ultimately lead to knowledge-based alliances between organisations (Wenger et al., 2002:15). As communities of practice develop over time, so does its members. Members develop professionally by keeping their finger on the pulse of new developments in

their fields and benchmark their own expertise against others across organisational boundaries. This provides organisations with the ability to foresee technological developments. Communities of practice can also possess the ability to spot emerging market opportunities of which organisations can take advantage. All of this can lead to a strong sense of professional identity for each individual community member. For organisations this means they will retain more talent, because of employees' professional and personal satisfaction (Wenger et al., 2002:16). Beside professional development, members have access to the fun of interacting and being with colleagues. Communities of practice create a sense of belonging which leads to more meaningful participation for its members. This confluence of short-term and long-term value creation illustrates a portion of what potential community of practice members and organisations stand to gain (Wenger et al., 2002:15).

### **3.2.2 Tangible and Intangible Value**

Communities of practice can provide organisations with tangible as well as intangible value through their operations. Developing standards manuals, improved skills and expertise, or reduced costs through faster access to necessary information is some of the tangible values created. Creating a sense of trust or an increased ability to innovate is some of the less tangible outcomes of communities of practice. These tangible values emphasise to business leaders the fact that communities of practice are not soft structures. Articulating the value of communities of practice by connecting their tangible benefits to performance outcomes leads to the legitimacy these structures require in order to achieve full potential. Without the necessary legitimacy within an organisation, communities of practice won't be able to steward knowledge effectively (Wenger et al., 2002:15). Even though the tangible value communities create is very important to emphasise, some of their greatest value lies in intangible outcomes. Intangibly, a community of practice builds relationships among people, creates a sense of belonging, generates a spirit of inquiry and confers a professional confidence and identity to its members, just to name a few (Wenger et al., 2002:15).

### **3.2.3 Strategy-Implementing and Strategy-Making Value**

Communities of practice can help organisations to realise their business strategy, seeing that strategy implementation often depend on the participation of highly competent and knowledgeable practitioners. It is highly likely that the members of a community of practice are the individuals who understand the company's products and services the best. They will also be aware of market trends and what is required to out-smart and out-perform the

competition (Wenger et al., 2002:17). Besides strategy implementation, communities of practice can assist with the formulation of new strategies. Procter & Gamble and McKinsey are two of the most well-known companies making use of communities of practice to implement and create new strategies. As communities of practice mature over time, they keep themselves well-informed of market trends and opportunities. This consequently allows communities of practice to inform the organisation of these possible opportunities or even enact strategic initiatives when suited (Wenger et al., 2002:17).

### **3.2.4 Combining the organisation's and community members' needs**

Probably the most important value that communities of practice create is by connecting the personal development and professional identity of practitioners to the strategy of the organisation. Seeing that the members of the communities and the organisations stand to gain, it must be clear just how members directly benefit from participation and how values created contribute to the organisation as a whole. Otherwise members will not invest themselves in the communities, compromising potential success. Similarly, the organisation will struggle to justify investment in these communities as well as their legitimacy if the communities of practice's values are not appreciated (Wenger et al., 2002:17). Wenger et al. (2002:18) believe that the ability to combine the needs of organisations and community members is crucial in the knowledge economy, seeing that companies depend on fully leveraging employees' creativity in order to succeed. These potential values communities of practice offer organisations are the reason why they are becoming a central part of the management agenda (Wenger et al., 2002:18).

### **3.2.5 Knowledge Organisation**

The value created by communities of practice often manifests outside the community, somewhere within or between organisations (Kahan, 2004:33). Multi-membership of employees create a learning loop, as members of teams and workgroups can take problems they encounter in performing daily tasks to their communities of practice which help solve these problems (Wenger et al., 2002:18). Members can use them as a platform to discuss new solutions and even document them, all contributing to the community's practice. Members can take these generalised solutions and experiences back to their teams and workgroups where it can be tested in practice. This learning cycle can continue indefinitely. This is why communities of practice are so valuable to organisations, allowing members to transport knowledge created within the community to line operations (Wenger et al., 2002:19).

In a business environment continuously in flux, where business units are constantly being re-organised, projects come and go and teams are assembled and dispersed, communities of practice provide a welcome form of stability. Communities provide a place where members can form an identity without being pressured to apply their expertise to meet specific organisational goals (Wenger et al., 2002:20). This organisational structure where the formal structure continuously changes to meet shifting market needs and the informal voluntary structures organised around knowledge as a source of stability, is becoming more common. This is why companies are beginning to take notice of communities of practice as an option to ensure some sort of stability for employees. They are even being considered as a foundational structure on which to build an organisation (Wenger et al., 2002:21). The elements of how communities of practice are normally structured are the topic of the next section.

### **3.2.6 Innovative Role of Communities of Practice**

In terms of communities of practice, innovation can be defined as the effective exploitation of ideas in order to develop new products, services, processes and practices. This definition emphasises the point that innovation concerns more than just coming up with ideas, but also requires the application and productive use of those ideas. In this sense, innovation is seen as embedded in business practice (Hensman & Haine, 2007:28). Communities of practice provide organisations with a freer and more flexible environment which fosters innovation, but ensures that its operations and resulted innovation are linked to and embedded in the business practice and processes of the organisation (Hensman & Haine, 2007:29). Communities of practice gain their innovative potential from their ability to solve a general problem, by developing a new solution which can be implemented in practice. The operations of communities of practice can lead to either radical or incremental innovation, even though the latter has been shown to manifest more often in practice (Pór, 2005:24). When it comes to incremental innovation, focusing on the internal dynamics within a single community of practice may be sufficient. Radical innovation, however, requires a focus on a network of connected communities of practice (Pór, 2005:36).

Polanyi (1966) coined the term tacit knowledge in order to describe the concept that people know more than they can express. Tacit knowledge has been shown to be significantly important for innovation, especially in the process of radical innovation (Hensman & Haine, 2007:30). Communities of practice gained attention based on their ability to serve as effective

means for the transfer of tacit, practice-based knowledge made possible by their informal, interactive group-based characteristics. The transfer of tacit knowledge is facilitated by high levels of trust and strong personal ties between the practitioners involved in communities. The importance of communities of practice, in terms of fostering collaborative learning in organisations, has been recognised by researchers, as well as practitioners (King, 2009:179). Communities of practice provide organisations with a way to elicitate tacit knowledge from members' through collective practice. This is done by either making tacit knowledge explicit through documentation or by making tacit knowledge, even more importantly, shareable within a community of practice as members build strong, trust-based relationships and develop a shared practice (Hensman & Haine, 2007:30).

Communities of practice derive one of their central benefits from their ability to evade the fossilising or paralysing tendencies of large organisations, through constantly changing. Brown and Duguid (1991:41) argue that communities of practice, through their constant adaption to changing membership and changing circumstances are continuously evolving, allowing them to become significant sites of innovation. This ability allows communities to bridge the gap between their organisation's rigid view on work and the challenge of changing practice. Communities of practice provide organisations with the means to examine the potential of alternative views of organising activity through experimentation, which are continuously informed and evaluated by experience. Communities can step outside the limited world view of an organisation and experiment with something new, possibly leading to change and innovation. This whole process of development by communities of practice is inherently innovative (Brown & Duguid, 1991:50). In effect, communities of practice provide organisations with the possibility to become enacting organisations. Enacting organisations are proactive and highly interpretive, as they not only respond to their environment, but also create many of the conditions to which they must respond. To a certain extent, they construct their own environments as they break conventional boundaries (Brown & Duguid, 1991:51).

Communities of practice can contribute to all phases of innovation. Generally, innovation is seen as consisting of three main phases, namely the ideas generation and evaluation phase; implementation phase and commercialisation or generalisation phase (Pór, 2005:33). In the first phase, ideas are collected, evaluated, connected and reconceptualised. Knowledge and expertise converge from numerous sources, to create patterns of new potential. The robustness of these patterns determines the vitality of the innovation that may derive from them. Robust patterns lead to innovations that may withstand and perform well under



changing circumstances. Communities of practice are able to assist in this phase as they are more conducive to trust building than more traditional, hierarchical organisations. Trust creates the safe environment in communities which is required for members to take risks and experiment with ideas. Each community of practice focuses on a domain of practice, creating an evolving body of knowledge for that domain. The collaborative development and validation of ideas by community of practice members contribute to organisational capabilities. Consequently, how well these knowledge assets are organised and validated is an essential factor of an organisation's innovation capacity as it makes the detection of innovation opportunities significantly easier (Pór, 2005:33). The second phase, concerns the implementation of the innovation generated in the idea phase. Implementation requires the effective coordination of action across various organisational teams, units and communities. Relationships based on trust enhance coordination as there is less friction, lower transaction costs and improved results. The relationships within and between communities of practice, as well as between communities and other individuals, has an essential role to play in this phase. The third and final phase concerns the commercialisation of the new innovations which can accelerate innovation acceptance. This is done by gaining access to accounts of the successful uses of the new innovations (Pór, 2005:34). Communities of practice can play a crucial role in the accelerated adoption of innovations, especially if it is highly complex innovations. Members support each other in the use of new products, services, procedures and processes. They reinforce the value of the innovations in their daily lives through their shared passion and experiences (Pór, 2005:35).

Besides their direct contributions mentioned above, communities of practice can indirectly support and facilitate innovation. Communities can shape an organisation's culture as innovative practices become a natural part of daily organisational life. Communities of practice are platforms where collaborative problem solving and innovation are internalised as part of the community member's daily activities. In a sense, innovation becomes the by-product of how employees conduct their work. Communities of practice also enhance the development of productive conversation which elevates the innovation percentage of an organisation. Communities allow members to question assumption and build on one another's ideas through productive dialogues (Pór, 2005:35). Innovative ideas do not just appear, but rather spawn from productive conversations. Organisations that realise the importance of productive dialogue can facilitate critical debate within and across communities. Furthermore,

communities of practice can provide an environment of innovation, which attracts innovative people. This may support organisations in order to retain key employees for innovation.

Communities of practice influence the business outcomes of their organisations in many ways. Lesser and Storck (2001:836) identified four areas of organisational performance that are impacted by the continuous activities of communities of practice. Firstly, communities of practice assist in decreasing the learning curve of new employees. Organisations need to make sure that new employees quickly become accustomed to the methods, tools and activities of their new position in order to rapidly increase their productivity. Communities of practice provide a platform for the initiation of new employees in order to get them to learn both the technical and cultural aspects of their new roles and responsibilities. New employees are able to interact with individuals with the same or similar work activities (Lesser & Storck, 2001:836). These community members can serve as mentors for the newcomers, fostering relationships between new and established practitioners within the organisation. Secondly, a community of practice allow organisations to respond more rapidly to customer needs and inquires. Customers, current or prospective, demand rapid feedback on requests, as well as the quick embodiment of needs into product and services. Communities of practice can help identify the experts which may provide the best possible answers or solution to customer requests and problems (Lesser & Storck, 2001:837). Communities of practice also develop a shared body of knowledge, usually including a repository of explicit knowledge, which can be used in order to easily locate required information. Thirdly, communities of practice reduce the need for rework and prevent the so-called, reinvention of the wheel. Communities of practice allow members to more easily reuse existing knowledge assets as they help maintain organisational memory. They increase an organisation's ability to locate; access and apply existing knowledge to new situations. These repositories also assist in the evaluation of trustworthiness and reciprocity of others. Consequently, individuals can build reputations both as experts in certain subjects and as individuals that are willing to help others (Lesser & Storck, 2001:838). Lastly, communities of practice, as already mentioned, help generate new ideas for products and services. They mainly serve as breeding grounds for innovation. Communities provide a forum of debate around a common subject where divergent perspectives are encouraged, even from outside the community of organisation. Members are willing to share innovative ideas with those they trust, and together explore new ideas (Lesser & Storck, 2001:839).

These four processes enhance the performance, as well as the innovation outcomes of organisations. Each area makes an important and unique contribution to the corresponding business outcomes (Lesser & Storck, 2001:840). Organisations can internalise communities of practice within their organisational boundaries in order to facilitate or guide the continuous sources of ideas and innovation (King, 2009:199). Whether communities of practice fulfil their direct or indirect innovation potential, large depends on the attention and support they receive from management and organisation as a whole (Pór, 2005:36). Consequently, we have seen that the activities of a community of practice are inherently innovative processes and they are proving to be a crucial aspect of organisational learning and knowledge management (Braun, 2002:45). The next section explores the structural aspects of communities of practice and how their structural elements facilitate and support the effectiveness of their operations.

### **3.3 The Structural Elements of Communities of Practice**

Communities of practice can take many forms and vary widely in both name and style. Wenger et al. (2002:24) emphasise this by stating that communities of practice “are as diverse as the situations that bring them into existence and the people who populate them”. In this section some of this variety of forms is explored, also looking at similar fundamental characteristics they may have in common. Knowledge of these variations allows people to recognise communities of practice in different organisations irrespective of their name or form (Wenger et al., 2002: 24). Communities of practice can be small, only having a few specialist members, or large, consisting of hundreds or even more than a thousand members. Just as in the case of organisations, the size of communities of practice determines to a significant degree how they are structured. If a community of practice consists of many members, subdivision might be needed to encourage all members to actively participate. The subdivision may be according to geographic region or by subtopic, depending of the context and situation of the particular community (Wenger et al., 2002:25). The lifespan of communities of practice can also vary considerably. Wenger et al. (2002) broadly classify them into two categories, namely long-lived or short-lived communities of practice. Communities of craft workers, such as watch makers have existed for centuries. These communities pass their knowledge and expertise down from generation to generation. In an organisational context, such long-lived communities are extremely unlikely, even though shorter-lived communities have existed in organisations for many years. A community of practice can only assist an organisation as long as the organisation itself exists. In today’s

high pace and volatile business environment organisations come and go, resultantly shorting the possible life span of communities of practice (Wenger et al., 2002:25).

A community of practice can either be co-located or distributed. In order for communities to create a shared practice, members need to interact on a regular basis. Being co-located makes these interactions significantly easier, even though it is not a necessity. Alternatively members can be geographically distributed all over the globe, even more so in the globalized world we live in today. Advances in information technology have made interaction over geographical space possible, allowing more personal, instant and effective communication to take place at any-time, anywhere. Communication between members can take many forms, ranging from face-to-face to web-based communication, but it does not determine knowledge-sharing between members. It is the existence of a shared practice, a common set of perspectives, problems and situations that allows members to share knowledge on an on-going basis. As new technology and globalisation progress, creating a global village, distributed communities of practice are becoming a common phenomenon in the business world as global collaboration is increasingly becoming a necessity (Wenger et al., 2002:25). Furthermore, communities of practice can either be homogeneous or heterogeneous. Homogeneous communities consist of members from the same discipline or function, where heterogeneous communities bring people with different backgrounds together. Putting a homogeneous community of practice in place is regarded as easier because of members' similar backgrounds. But having a problem in common can also be a strong motivator for building a shared practice, even among people with heterogeneous backgrounds (Wenger et al., 2002:25).

In an intra-organisational context, communities of practice can either exist within one specific business unit, or stretch across several. On the other hand communities can even stretch across organisational boundaries and create inter-organisational communities of practice. Knowledge is distributed within and between organisations, requiring communities of practice to transcend boundaries, both divisional and organisational (Wenger et al., 2002:26). Communities of practice can form spontaneously out of a common need by peers to become learning partners without any help from the organisation. Otherwise organisations can intentionally initiate and support communities to steward a needed capability. Whether spontaneous or intentional, the community itself determines its level of formality (Wenger et al., 2002:26). Lastly, communities of practice can range from completely unrecognised to being largely institutionalised. Informal meetings and discussion leading to new knowledge

between members can go unnoticed by the organisation, leaving this type of communities of practice unrecognised. At the other extreme, communities of practice can be completely incorporated into the formal structure of the organisation, institutionalising its existence. Other relationships exist between these extremes from less recognised to more recognised, namely bootlegged, legitimised and supported communities of practice. No one of these is necessarily better than the others, but each relationship faces different challenges, individually requiring a diverse set of solutions (Wenger et al., 2002:27).

Despite the variety of forms that communities of practice take, they all share a basic structure. Wenger et al. (2002:27) state that every community of practice has three fundamental elements: a domain of knowledge, a community of people and the shared practice. The domain creates common ground and a sense of common identity (Wenger et al., 2002:27). It designates the topic the community focuses on and creates boundaries, enabling members to decide exactly what is worth sharing. It also defines how members present their ideas and which activities to pursue. Contribution and participation by members are also inspired by the particular domain. The domain also helps members to recognise potential ideas and topics as it is the frame participants use to both limit and focus activities on the most relevant and worthwhile elements (Wenger et al., 2002:28). A community refers to the group of people who care about the particular domain. The community nurtures interactions and relationships, creating mutual respect and trust among members. In effect, the community creates what Wenger et al. (2002:28); refer to as the “social fabric of learning”. It encourages all the necessary elements required to promote knowledge sharing and knowledge creation between participants. Members are encouraged to ask the right questions, share ideas and listen carefully to others. Lastly and most importantly, community creates a matter of belonging which is necessary for learning to take place (Wenger et al., 2002:28). The third element, practice, is the shared practice that members are developing together in order to be effective in their domain. The practice is in essence the set of frameworks, ideas, tools, language, stories, documents, etc. that community members share. In effect, it is the specific knowledge the members develop, share and maintain. This shared body of knowledge and resources enables the community to proceed efficiently in dealing with the designated domain (Wenger et al., 2002:29). Communities of practice are potential social structures that can assume responsibility for developing and sharing knowledge. However, these three fundamental elements need to function well together in order for a community of practice to be an ideal knowledge structure (Wenger et al., 2002:29).

Based on the basic structural elements of a community of practice, it is clear that not every community is a community of practice. It refers to a very specific type of social structure with a very specific purpose. The primary purpose of a community of practice is to develop knowledge. More specifically communities of practice should steward knowledge and foster learning (Wenger et al., 2002:41). In contrast to business units, communities of practice are more loosely connected, informal and self-managed, even when institutionalised (Wenger et al., 2002:41). All organisations have informal networks of people. These networks communicate, share information, as well as build relationships and reputations. Communities of practice are different to these networks based on the fact that they are about something. Communities of practice have a specific domain they each focus on and are not just a set of relationships (Wenger et al., 2002:43). But having a domain or a shared practice does not make a group a community of practice. In a community of practice all three elements, domain; community; and practice, exist and function well together (Wenger et al., 2002:44). For organisations to cultivate communities of practice, they must use the synergy between these elements to help a community evolve and fulfil its potential. The next section explores how communities of practice can be cultivated in order to maximise their potential (Wenger et al., 2002:47).

### **3.4 Inter-organisational Communities of Practice**

It is no secret that both executives and academics believe that organisational learning is perhaps the key factor in achieving sustainable competitive advantage. In the late 1980's De Geus already acknowledged that the ability to learn faster than one's competitors, is probably the only way a company can sustain its competitive advantage (Dyer & Nobeoka, 2000:346). Traditionally learning within organisations has been seen to occur on three inter-related levels, namely individual, group and organisational. But some researchers (Kekäle & Vitiitala, 2003) have acknowledged a fourth level, as organisations link together in networks to learn from one another. The fourth level is referred to as inter-organisational learning or network-learning (Juriado et al., 2007:52). Normally research on organisational learning has solely focused on an individual organisation, but networking between organisations is continuously gaining attention. Since the late 1950's numerous scholars, such as March, Simon, Powell and Levinson, have touched on inter-organisational learning. They recognise that inter-organisational learning is critical to an organisation's competitive success. Organisations learn by collaborating with each other as well as observing and implementing other's practices in their own internal structures (Juriado et al., 2007:53).

The knowledge economy has pressed organisations to focus even more on knowledge. The limitations of early technologically based attempts to capture and store knowledge have drawn our attention to the social and cultural dimensions of knowledge. Communities of practice have become a viable knowledge-based structure that organisations can use to support learning and knowledge within or between companies (Wenger et al., 2002:231). Few studies have been conducted on how learning takes place in communities across organisational boundaries, even though project-based organisations and networks are raising in popularity. The studies that do exist have focused on learning through either inter-organisational partnerships or external communities of practice (Juriado et al., 2007:51). A trend in the knowledge economy towards communities of practice is not confined to the boundary of a single organisation. These communities of practice can transcend organisational boundaries, giving rise to inter-organisational communities of practice. Today many companies are creating business-to-business clusters with suppliers, distributors, retailers and even customers. This is largely thanks to the global trend of outsourcing that has become a major part of the business world today. These inter-organisational communities of practice help organisations to both maintain their internal expertise, while strengthening relationships with their partners (Wenger et al., 2002:220).

Creating these relationships, gives organisations the potential for significant knowledge exchanges. They are in some cases referred to as knowledge sharing networks, where organisations and suppliers work together to improve operations (Wenger et al., 2002:221). The Japanese automobile networks, in particular Toyota, have been supremely successful in transferring know-how throughout their networks. They nurture bilateral and multi-lateral knowledge sharing networks with suppliers, all leading to superior inter-organisational learning. Toyota not only helps each individual supplier, but encourages mutual relationships among all suppliers. Suppliers are expected to share lessons learned among each other in order to improve quality and efficiency. Toyota's knowledge sharing network is built on three elements. Firstly, a supplier association creates general ties among suppliers. Based on the number of suppliers, these ties are normally weak. Secondly, a consulting group serves as a support group to the network. They provide the necessary education and assistance which may be required. Finally, Toyota makes use of study groups to build stronger ties between suppliers. Companies normally voluntarily participate in these study groups. The main goal of these groups is to foster multilateral ties among specifically selected suppliers. Normally these networks consist of five to ten companies who collectively work on various themes.

Participants regularly visit each other's facilities in order to make suggestions and learn together. They also meet annually to present key insights to one another. By implementing this system, Toyota has succeeded in creating a shared norm of exchange and mutuality among suppliers, ultimately leading to enhanced improvement in performance and productivity (Wenger et al., 2002:221). Organisations can also create networks with their consumers. These communities allow organisations to gain access to valuable knowledge surrounding consumer wants and needs. Ultimately, these consumer networks help organisations to serve their customers better, benefitting both the organisation and its customers (Wenger et al., 2002:221).

Organisations in the knowledge economy need each other to learn and stay competitive. This need has resulted in a growing number of inter-organisational partnerships. These partnerships can range from full mergers to joint ventures to loose learning and innovation networks (Wenger et al., 2002:222). Partnering with competitors allows organisations to take advantage of market opportunities which requires complex knowledge, resulting from pooling knowledge together. Trust is the key factor that makes these partnerships possible. Trust from all practitioners is required in order for them to gain access to new capabilities from one another. Absorptive capacity is also needed by all participating organisations, which allows them to make use of what they have learned from one another. According to Wenger et al. (2002:223), inter-organisational communities of practice are ideal vehicles for realising the knowledge potential that exists across firms. Organisations within partnering networks, pool resources to access outside expertise, learn from each other's experiences and work together to create a common baseline of knowledge. These networks accelerate and strengthen an organisation's learning process, extend their range of knowledge, allow learning from each other's successes and failures and share the risk and burden of doing so (Wenger et al., 2002:223). It will become easier to apply thus communities of practice outside the organisation, as experience is accumulated over time (Wenger et al., 2002:231).

According to Wenger et al. (2002:232), organisations that understand how to leverage communities of practice will be the leaders of tomorrow. They must be able to translate the power of communities into successful knowledge organisations. This will allow these organisations to be more successful in the market place and allow them to become learning laboratories for exploring how to design the world as a learning system (Wenger et al., 2002:232). This is very transformative, changing the status of the organisation from source to convener. It is believed that the power will be shifted closer to the way things really work, so



that they are more in line with our behaviour. This will in fact result in a new way of doing business, where organisational design reflects people's actual behaviour. Wenger believes that such organisations will successfully contribute to the marketplace and ultimately the world (Kahan, 2004:35).

### **3.5 Downside of Communities of Practice**

Like all human institutions, communities of practice also have shortcomings. Wenger warns of the double-edged sword characteristic of communities of practice. Even though it can provide an organisation with massive amounts of value, it also has its dark side (Wenger, 2001:41). Communities of practice have been guilty of hoarding knowledge, limiting innovation and holding members captive to their expertise. Because a community of practice consists of people who also form part of society and likely having homogenous interests, communities can easily reflect the narrow and unjust preconceptions of society. As already stated in the chapter, communities of practice are not a silver bullet for all organisational problems. Organisations must have realistic expectations and importantly not romanticise them. Just as communities can solve problems, they can also be responsible for creating some (Wenger et al., 2002:139). In some cases communities can likely be part of the problems they are trying to solve. The positive connotation to the term 'community' may be misleading and can easily lead to idealisation. Wenger et al. (2002) look at the potential pitfalls of communities of practice at three levels. The single community, groups of communities and organisations. The aim is to help people recognise these shortcomings in order to manage them as far as possible (Wenger et al., 2002:140).

#### **3.5.1 Single communities**

Wenger et al. (2002) differentiate between two general types of disorders most communities may suffer. Firstly, a community may simply not be functioning well. The second reflects the inherent human weaknesses of its members, seeing that all communities consist of people (Wenger et al., 2002:140). Implicit assumptions can go unchallenged in tightknit communities whose intimacy may also lead to barriers to possible new members, new ideas and even to critique one another. Ironically, the same qualities that serve as a community's strengths can become disorders when taken to the extreme. Disorders may arise when essential qualities are either missing or pushed out of balance. They can directly affect a community's domain, community, or practice. These qualities can turn into devastating disorders that cause a community to stagnate or even cease to exist. (Wenger et al., 2002:141).

Disorders from the domain, community and practice can combine and reinforce each other. The fact that many disorders are simply extensions of the positive qualities of communities, they can arise in any community, successful or not (Wenger et al., 2002:150). To some degree these disorders are inevitable, but luckily in most cases not fatal. In order for communities and organisations to gain access to the benefits of communities, they must endure the negative aspects associated with it. This means that organisations cannot deny, avoid, or get rid of these disorders, but rather they must recognise these disorders and learn to manage them when they arise. For that reason communities must continuously be given new challenges and welcome new ideas and agendas that arise. The quicker a disorder is recognised, the sooner it can be dealt with. The key is to acknowledge a community's shortcomings and leverage this awareness to spur its growth and in so doing, reaffirm the community's long-term vitality (Wenger et al., 2002:150).

### **3.5.2 Groups of Communities**

A community of practice's effectiveness depends not only on internal development, but also on how they connect with other communities. This is because communities do not exist in isolation. In the previous section, the focus was on the problems that can arise inside a single community. Now the focus shifts to the problems of groups of communities inside and across organisations. A community's domain, community and practice create boundary lines between communities (Wenger et al., 2002:150). Boundaries of practice between communities give rise to two challenges for managing knowledge in organisations. Firstly, knowledge sticks to a specific practice, making it difficult to share knowledge throughout the organisation without having a shared practice between communities. Secondly, knowledge is also leaked through practice channels, making it difficult for organisations to avoid knowledge spill over to other organisations (Wenger et al., 2002:151).

It has been found that knowledge sharing over the boundaries of practice is extremely difficult, if not impossible in some cases. A shared practice creates a specific language, methods and jargon between practitioners which is required to effectively share knowledge. Knowledge in effect sticks to a particular practice, delaying or obstructing knowledge transfer within organisations (Wenger et al., 2002:151). Good communication and strong relationships between practitioners and business leaders within an organisation are required to aid knowledge transfer (Wenger et al., 2002:152). Communities are not confined to a specific organisation and transcend organisational boundaries. Boundaries of practice also

transcend institutional boundaries. Multi-membership of teams and communities can connect practitioners over organisational boundaries. A shared practice between these individuals allows them to easily transport knowledge between organisations. Shared practices across organisational boundaries provide channels for sharing information and ideas efficiently. In some cases, it is even easier for organisations to gain knowledge from practitioners in other organisations than from within the organisation itself (Wenger et al., 2002:152). These risks are unavoidable for organisations, raising the need for them to effectively manage these risks (Wenger et al., 2002:153).

Even though boundaries may have negative connotations, of limitations and exclusion, they are sources of new opportunities. According to Wenger, boundaries are not barricades but serve as agents of context and equilibrium (Kahan, 2004:32). Boundary crossing can be a source of deep learning as interaction across practices force people to take a new perspective on their own assumptions. Radical new insights and developments often arise at the boundaries between communities (Wenger et al., 2002:153). Today's complex problems increasingly requires boundary crossing to take place. It is likely that one specific practice or even organisation may not have the solutions for these problems. This requires communities of practice to link to other communities, both inside and outside the organisation, crossing all kinds of boundaries. Managing these linkages is important for organisations, in order to avoid the leakage of private or important knowledge. Communities of practice in this sense create both difficulties as well as opportunities (Wenger et al., 2002:153). Activity at a community's boundaries is very important to ensure renewed learning and prevent fragmentation. Building trust is essential in boundary crossing, both inside the community itself and through boundary interaction. To become a massive knowledge asset, communities of practice need their core and boundaries to evolve in complementary ways. This allows the core to develop deep expertise inside the community and the continuous renewal at the boundaries (Wenger et al., 2002:154).

### **3.5.3 Organisations**

Organisational barriers can affect a community of practice's ability to steward knowledge. Typical examples of the recurrent organisational problems include: irrational politics, short-term focus on tangible outcomes and anti-learning culture. Irrational politics refer to internal warfare on an on-going basis that may hinder knowledge sharing (Wenger et al., 2002:155). Organisations may focus on short-term tangible outcomes, forcing the focus on achievement

to be on things such as technology and documentation, even though the community can contribute much more in relation to strategic priorities of the organisation. An anti-learning culture within an organisation may discourage learning, reflection and knowledge sharing. This can be done by putting value exclusively on individual tasks and performance. An organisation's policies and infrastructure may also discourage participation. Within such organisations, communities of practice are marginalised leading to the serious limitation of their effectiveness (Wenger et al., 2002:156).

Organisations risks rigidity when they organise knowledge into communities (Wenger et al., 2002:156). Communities of practice can be resistant to signs of change. A successful, tight knit community will be reluctant to change as members reinforce each other's perceptions and aspirations. As a community gains status and a reputation over time, inertia may be created at both the individual and group level. These communities find it difficult to change, consider other perspectives and to listen to other communities. On the other hand, communities of practice can also be a remedy to rigidity. Communities can work both ways, digging a company deeper or pull it out of rigidity (Wenger et al., 2002:157).

### **3.5.4 Inference of Downsides**

After dedicating a whole chapter to the shortfalls of communities of practice in the book 'Cultivating Communities of Practice' (2002), credit must be given to Wenger not romanticising or idealising the concept. Wenger seems completely realistic when he considers communities of practice limitations, thoroughly considering both sides of the coin. He believes that disorders are unavoidable in communities of practice seeing that they are composed of humans, but the possible values they create still outweigh their downside. As many things in life, organisations must in other words endure the good with the bad. According to Wenger, most disorders are only strengths pushed out of balance. Consequently, cultivating communities become a balancing act, requiring organisations to manage disorders instead of unrealistically trying to deny or get rid of them. Wenger prescribes implementing possible countermeasures in order to manage disorders that may arise (Wenger et al., 2002:141-157<sup>4</sup>). This all comes back to ensuring that organisations have the correct expectations of communities of practice, not seeing them as solutions to all problems.

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<sup>4</sup> Wenger et al. (2002) explains various disorders that may result in the practice of communities of practice in different scenarios and contexts. This is done by dividing the disorders into single communities, groups of communities and organisations. Wenger et al. (2002) also discusses possible countermeasures in order to manage and eliminate these disorders in different settings.

Disorder must rather be seen as possible opportunities organisations can leverage for greater gain. Even though Wenger acknowledges the shortfalls of communities of practice, strong critique still exist questioning the validity of the concept. The three main lines of criticism on Wenger's concept of communities of practice are the topic of the next section.

### **3.6 Critique of Wenger's Community of Practice**

Since its inception in the late 80's, the term community of practice has had a massive impact on diverse fields of theory and practice. Communities of practice have had impacts on the fields of academics, business, government, education, health and the civil sector. Wenger himself acknowledges that even though the concept has influenced theory and practice in a wide variety of fields, there have also been serious critiques. These critiques are diverse, subtle and complex from both a theoretical standpoint and among practitioners (Wenger, 2010:7). Wenger furthermore acknowledges the validity of these critiques and believes that their challenges will help sharpen the field of community of practice (Wenger, 2010:8).

#### **3.6.1 What about Power?**

One of the main lines of critique on the concept of community of practice regards the lack of emphasis on issues of power. The term community unintentionally creates to some degree a feeling of harmony and homogeneity, even though Wenger states disagreement and conflict within communities of practice can be a common phenomenon. Furthermore, communities of practice are self-generating, obscuring the fact that they are influenced and shaped by their institutional, political, or cultural context (Wenger, 2010:8). Wenger's community of practice is being accused of being a powerless concept as the theory takes learning as its foundation and its focus, not power. Wenger neglects to explicitly give account of the role power plays in communities of practice. Critiques believe that power must play a central and fundamental role in communities seeing that they involve groups of diverse individuals and is situated within or between organisations falling under their jurisdiction (Wenger, 2010:8). Different versions of this line of critique exist. Contu and Willmott (2003)<sup>5</sup> have focused on institutional settings in capitalist modes of production. Barton and Tusting (2005)<sup>6</sup> have

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<sup>5</sup> Contu and Willmott (2003) critiques Lave and Wenger's conception of communities of practice as a medium of learning by arguing that it is displaced by a managerial preoccupation with harnessing communities of practice to the fulfilment of corporate objectives. They believe Lave and Wenger does not give enough credit to the role power plays in organisational learning and that communities of practice are embedded these power relations.

<sup>6</sup> The book address a variety of areas which Barton and Tusting (2005) feel tends to be overlooked within the theory of communities of practice. These include the theories of language, literacy and discourse; issues around

looked at the use of language as a tool of power. Lastly, Fox (2000)<sup>7</sup> and Jewson (2007)<sup>8</sup> have focused on the spread of influence in networks through which action is possible.

### **Wenger's Possible Response**

All social systems, such as communities of practice, within which learning takes place inherently involves issues of power. Within a community of practice, the definition of accountability, competence and who is regarded as competent are all questions of power. Power determines these definitions within every community of practice. In the same sense, the criteria for learning are determined by power and consequently learning leads to power. Wenger believes that learning and power imply each other (Wenger, 2010:8). The basis of power in communities of practice, according to Wenger, is formed by accountability and identification (Wenger, 2010:8). Identity and community is an important pairing for the effectiveness of power. Members must identify with a community in order to make them accountable to its regime of competence. This makes members vulnerable to the community's power plays. Resultantly the efficacy of power depends on the members' degree of identification with a community of practice. Identity is what makes a regime of competence effective or irrelevant as a source of accountability (Wenger, 2010:9). Both are horizontal, mutual, negotiated, often tacit and informal. However, this type of power is in no means less effective than vertical hierarchies which are more visible (Wenger, 2010:8).

The power dynamics of learning are not confined to the boundaries of communities of practice, but also take place in a landscape of practices which stretches far beyond the boundaries of a single community. The claims towards competence outside the community are also determined by power, leading to the legitimacy of the community of practice if its claims to knowledge are regarded as successful. There is a defined divide between power and competence within a community of practice and beyond its boundaries. Successful claims to competence within a community may not translate to claims to knowledge outside its

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power, resistance and inequality; micro-interactional and sociolinguistic takes on negotiation of meaning, tension and conflict; multilingual and other hybrid situations and theories of risk and stigma.

<sup>7</sup> Fox (2000) introduces Foucault's work and actor-network theory (ANT) in order to form the basis of a constructive critique on the theory of communities of practice. He argues that community of practice theory and ANT can enrich each other and together make a stronger contribution to our understanding of organisational learning.

<sup>8</sup> Jewson (2007) co-authored the book *Communities of Practice: Critical Perspectives*, which provides and critical introduction to the theory and application of communities of practice and their use in a diverse range of managerial and professional contexts. In one chapter he wrote, titled "Cultivating networks analysis: rethinking the concept of "community" within communities of practice", he explores the propagation of influence throughout networks and how it enables action.

boundaries (Wenger, 2010:8). In this sense Wenger will argue that power runs through the formation of communities and their production of practice. Resultantly the concept of communities of practice is to a large degree political (Wenger, 2010:9). According to Wenger, the concept of community of practice produces an innately political view of learning, leaving power and learning always intertwined. In this regard power and learning are indeed inseparable. But Wenger elaborates stating that even under conditions of absolute control; practice is the production of a community through participation. This represents a limitation to the application of power in communities of practice. In effect, the creation of a practice takes place, not as an outcome of, but in response to power (Wenger, 2010:9).

### **3.6.2 Instrumental Slippery Slope**

The concept community of practice also has practical implications which bring us to another major line of critique against Wenger. The concept of community of practice started out as an analytical one which provided a name for an existing phenomenon. After its inception, people started using the concept almost as a technique instead (Wenger, 2010:10). People use it to create, cultivate, or capitalise on the process. In effect the concept has shifted to an institutional one. Consequently, critics believe that the concept will lose its analytical acuity which made it useful in the first place. Originally its formulation was used to distinguish practice from prescription and to view learning as inherent in practice rather than refined in an educational setting. Instead of becoming sharper and more coherent with time, the concept of community of practice is becoming diluted and heterogeneous as theorists and practitioners use it to fit their needs (Wenger, 2010:11).

#### **Wenger's Possible Response**

Wenger will acknowledge this critique as a real concern, but distance himself from playing a key role in the concept's transition. Even though it is true that many people are using the concept without taking note of the broader framework or underlying principles, Wenger's work does not reflect the reckless and careless application of these two conceptions (Wenger, 2010:11). Some critique within the ranks of practitioners also exists, where they find the concept good in theory, but difficult to apply in practice. Wenger believes the reason for this is that communities of practice still do not fit very straightforwardly within traditional hierarchical organisations. These organisations find it difficult to create the right context for communities of practice in order for them to flourish. Which makes their cultivation by the organisation also highly problematic (Wenger, 2010:11). Wenger states that he does not

know whether the growing popularity and diversification of the concept will lead to its downfall. The uninformed applications might lead to too many failures, causing its abandonment in practice. The fragmented adoption and redefinition might also discourage academics from using it all together. Wenger himself believes that the joined application of both analytical and instrumental perspectives lead to productive results. He finds the tension helpful in pushing both perspectives forward, possibly leading to a new discipline focused on the learning capability of social systems (Wenger, 2010:11).

### **3.6.3 An Outdated Concept**

A very important line of critique on Wenger's concept of community of practice is that it's outdated. Some critique on community of practice focuses on a theoretical level, stating that Wenger introduced it in an ahistorical fashion, but that its learning process is bound to a specific era. Engeström (2007) believes that work in modern times requires more dynamic structures and that communities of practice have served its time (Wenger, 2010:10). Wenger will acknowledge that the concept is an attempt to capture something fundamental about learning, which is intended to transcend specific moments in organisational work. In fact, Wenger (2010:10) attempts to provide a learning foundation for "anchoring history in social practice". He also acknowledges that the notion of a community of practice will manifest differently in different societal contexts and also when these contexts evolve (Wenger, 2010:10). Other critics state that there is too much emphasis on community for a suitable interpretation of learning in today's web-enabled globalising world. These critics prefer the term network, as networks are considered by them to be more adapted to the volatile business worlds of today. Nowadays learning needs and connections are becoming increasingly fluid over a global scale, rendering the notion of community, according to them, old-fashioned (Wenger, 2010:10).

### **Wenger's Possible Response**

Wenger might acknowledge that some community of practice theorists and practitioners has overemphasised the community element of communities of practice based on its necessity for formation and development, wrongfully highlighting the positive connotations surrounding the term community. Secondly, Wenger believes that community and networks should not be regarded as distinct structures. Wenger regards community and network as two types of structuring processes. These two coexist where community emphasises identity and network emphasises connectivity. Communities of practice are also networks, but their identification



with a domain and commitment to a learning partnership differentiate them from most networks (Wenger, 2010:10). Irrespective of their differences, Wenger sees these two structuring processes as having complementary strengths and weaknesses. Both can be used to enhance the learning capability of a group. When a community of practice becomes too strongly identified with itself, getting closed off and possibly fall victim to groupthink, then promoting connectivity to make use of the strengths of networking is a good way to renew and open a community's boundaries. Networking elements can be a good counterpart to community. In the same sense, networks which are too fragmented and individualised may require community building to take place around an identity. This will give the network shape, leading to a degree of collective intention and commitment to learning. Consequently, Wenger believes that these so-called complementary concepts can help foster the best possible structuring processes for learning that is required in today's knowledge economy (Wenger, 2010:10).

### **3.6.4 Inference of Critiques**

All three lines of critique on Wenger's communities of practice discussed in this section are to a certain extent a threat to the concept's legitimacy. There is a definite lack of emphasis on power in Wenger's work. But the counter arguments presented above is more than satisfactory. In the end he acknowledges that power forms a central part of every community of practice, mediating many of its features. Even learning, which is the purpose of communities of practice, is seen by him as intertwined with power. In that case the power critique will not play a massive role in the arguments throughout the rest of the paper. The instrumental critique on communities of practice definitely has its merits, but can be seen as an opportunity rather than a downfall. If Wenger is correct, as I believe he is, the tension between the analytical and instrumental conceptions of communities of practice can be used to move the field forward. To a large extent the argument throughout this chapter and the next, holds an instrumental characteristic. But the analytical conception of community of practice still manifests strongly in certain sections, enabling to make use of the strengths of both conceptions. Resultantly the instrumental critique is marginalised as far as possible leaving it irrelevant for the purpose of the thesis. The third line of critique is definitely the biggest concern for the arguments presented in this thesis. If communities of practice are considered outdated or irrelevant in today's day and age, it renders the research of no value. Wenger also recognised the importance of this line of critique and co-authored a conceptual framework, promoting and assessing the value creation of both communities and networks

and their complementarity. Critics argue for the move away from communities and towards networks in today's volatile business environment. Wenger, as well as I, will try and counter this proposal by highlighting the complementarity of these two concepts and why it's better to incorporate both communities and networks and not one or the other, in organisations.

### **3.7 Conclusion**

Besides all the possible shortcomings, downsides and critique that exist on communities of practice, they are still effective structures for the facilitation and support of innovation. Even though they are not particularly equipped to search and explore new knowledge outside the community or its domain, they can be extremely effective in exploiting existing knowledge. Communities of practice are usually capable in finding novel combinations of existing knowledge and promote the effective exploitation of the new found knowledge which may lead to innovation. It is supported by their ability to also implement these new combinations of knowledge in practice. Communities of practice are able to implement and to some degree diffuse novel knowledge seeing that they are embedded in practice and concern themselves with knowledge and innovation that can be applied in practice. Communities of practice are equipped for small-scale diffusion of information and knowledge. Diffusion can take place within a particular small community and in some cases even between similar communities of practice, but they are not as well equipped as innovation networks for large-scale diffusion to take place. Consequently, communities of practice can play a major role in an organisation's innovation process, as they can create new knowledge which may lead to innovation, as well as implement and to some extent diffuse this new knowledge and innovation throughout the community and organisations involved. These processes of exploitation, implementation and diffusion complement the process of exploration, discovery and diffusion facilitated by innovation networks discussed in the previous chapter. The distinction and complementarity between communities of practices and innovation networks is the first focus point of the following chapter.

## **CHAPTER 4**

## 4 INNOVATION IN NETWORKS AND COMMUNITIES

### 4.1 Introduction

Innovation has become the main source of an organisation's competitive advantage in today's global business world (Swan et al., 1999:262). When innovation is discussed, it is normally very broadly described as the process of coming up with novel ideas or combining existing ideas in new ways. Consequently, innovation is roughly regarded as either innovation as novelty or innovation as change. These two types correspond to the processes of exploration and exploitation, as the former aims to improve or correct existing ideas and knowledge. Even though these two processes can be regarded as part of innovation, they do not however present the complete picture. Innovation is a highly complex, uncertain and political activity, consisting of several recurring and intertwined activities (Newell et al., 2009:53). When perceiving innovation through a process perspective, as I have done in this thesis, innovation concerns significantly more than just coming up with new ideas or combinations. Rather, innovation consists of three highly complex, nonlinear activities. Innovation involves the dynamic creation, diffusion and implementation of new ideas in different contexts (Newell et al., 2009:195). Resultantly, innovation requires more than just the creation of new ideas, but also requires implementation and diffusion of those novel ideas. Only creating new ideas are not sufficient to be regarded as innovation, as those ideas must be implemented in practice, as well as diffused more widely across the involved organisations (Newell et al., 2009:188). In practice, these three activities manifest as cumulative and iterative sets of occurrences, actions and fortunate coincidences. Numerous actors, various forms of knowledge and organisational tasks usually interact with unpredictable outcomes, where chance also plays a major role. The character of innovation forces innovation management to be more about creating an enabling context for such novel inventions to result, then attempting to force innovation with rigid structures and deadlines (Newell et al., 2009:194).

It has been highlighted throughout this thesis that knowledge is the most important resource in today's global economy as it is required for innovation. Knowledge needed for innovation is increasingly distributed both within and across organisational boundaries, necessitating networking as a vehicle for communication, encouraging the sharing of knowledge among organisations, which is central to process perspectives of innovation. Thus, innovation processes are becoming increasingly interactive, requiring simultaneous networking across multiple groups and communities, sometimes even on a global scale (Swan et al., 1999:263).

Organisations find it increasingly necessary to work together, because of the rising cost and increasing complexity of the work they must perform (Houghton et al., 2000:11). Inter-organisational networks allow participants to take advantage of a wider set of resources and improved capacity necessary to help solve some of the more multifaceted problems facing businesses and society as a whole (Hoberecht et al., 2011:24).

The question has become which networking options should organisations choose and how do organisations manage, facilitate and support their networking operations. The knowledge economy has rendered the traditional way of managing an organisation through direct control based on obedience and loyalty by employees as obsolete. Today management must decentralise power and authority so that empowered workers can use their own knowledge and experience to create solutions to the problems and opportunities they face on a daily basis. The right policies must be put in place together with the utilisation of the correct techniques in order to create the necessary context for networking to take place (Newell et al., 2009:231). Consequently, management is required to create an enabling environment for employees to create and sustain innovation relationships. Many options exist which an organisation can utilise in order to stimulate and support knowledge work (Kessels, 2004:170). Two of those options has been the focus of the thesis namely, innovation networks and communities of practice and how these two structures can stimulate and support innovation within and between organisations. In-depth discussions on both of these structures regarding their value, structure, downside and critiques have been made in the previous two chapters. This chapter will look at how these two structures of innovation relate based on their distinctions as well as complementarities. It will be argued that effectively combining these distinct structures and utilising their complementary effects on learning will lead to improved innovation, ultimately resulting in the maximisation of innovation potential in a specific situation.

It is widely accepted that there is no such thing as a universally optimal network structure best suited for every situation. The appropriateness of network structures is rather highly dependent on the environmental and specific context (Gilsing, 2003:27). This raises the possibility that every situation has an optimal innovation structure which best suites it operations. The optimal structure for a specific context is determined by several network theory concepts, namely the strength and density of ties, cognitive distance and the absorptive capacity between network partners. Each concept has an influence on how networks are structured and how they perform and innovate. Ensuring an appropriate mixture between these concepts will determine how the network innovates as well as the overall extent of

innovation within the network. The cognitive distance between the actors in a network illustrates the balance that needs to be struck in order to facilitate and support information and knowledge transfer within a network. Absorptive capacity of each network partner is important in the innovation process seeing that a high absorptive capacity is required in order to consolidate knowledge transfer. Creating the optimal innovation structure within a specific scenario is very elusive, because the required structure changes throughout the lifecycle of a project making the structure very dynamic. To reach the optimal innovation structure and process will require both aspects of exploration and exploitation. At first glance it seems that innovation networks possess attributes that promote exploration, whilst communities of practice possess attributes required for exploitation. It will be argued that combining the elements of both innovation networks and communities of practice will assist organisations to simultaneously promote exploration and exploitation which will allow them to move closer to the optimal innovation structure in every context. However, such a combination is not without difficulty, since innovation networks and communities of practice represent two separate areas of inquiry, with differing worldviews regarding the nature of knowledge and innovation and therefore often regarded as opposing approaches to innovation.

The chapter is divided into five main sections. The first section consists of an in-depth discussion on two structures that can facilitate and promote innovation, namely innovation networks and communities of practice. This is done by looking at the distinctions and complementarities between the two. The second section explores the innovation process required for innovation to take place. These activities are namely the dynamic creation, diffusion and implementation of novel ideas in different contexts. The third section covers the network concepts of strength and density of ties, cognitive distance and absorptive capacity respectively and how they influence collaboration and innovativeness. These network concepts are also related to innovation networks and communities of practice respectively. The fourth section reviews the literature on the optimality of network structures and proposes the possibility of creating an optimal innovation structure by structurally combining innovation networks and communities of practice. The last section investigates the roles innovation networks and communities of practice play in the innovation process and furthermore how these two structures can possibly be combined in theory and practice.

## **4.2 Distinctive structures, complementing each other**

Wenger et al. (2011) developed a conceptual framework for the assessment of value creation in both communities of practice and networks in general. Within the report they look at the distinction and relation between communities and networks. They think of communities of practice and networks as complementary in terms of learning potential, but view them as distinct structures (Wenger et al., 2011:8). Communities of practice and networks are usually thought of as two different types of social structures. Wenger et al. (2011:9), on the other hand, prefer to think of them as two aspects of social structure within which learning takes place. Within the social structure, the network aspect denotes the set of relationships and personal interactions among participating individuals who have reasons to connect. The purpose of networks are among others, information flow, helpful relations, joint problem solving and knowledge creation. The community aspect, within the social structure, refers to the development of a shared identity around a domain, leading to a joint commitment to stewarding knowledge of that domain (Wenger et al., 2011:9). Wenger et al. (2011:9) acknowledge that even when social structures are clearly dominated by one of these aspects, a 'pure' community or a 'pure' network is rarely to be found in organisations. Communities of practice commonly involve a network of relationships and participants in a network may share a commitment to some kind of joint practice (Wenger et al., 2011:10). Taking Wenger et al. (2011:10) perspective, we must focus on how these two aspects intertwine and integrate within a given group. Investigating these concepts, the questions should be how do they contribute to the cohesion and functioning of the group? For which participants does each concept dominate? And finally, what learning opportunities do they offer and what value do they produce (Wenger et al., 2011:10)? Each concept provides different value, present different risks and possesses different challenges (Wenger et al., 2011:10). In the next section, the focus will be on the distinction between innovation networks and communities of practice.

### **4.2.1 Distinction between the Innovation Networks and Communities of Practice**

Following the previous chapters, it is evident that innovation networks and communities of practice are distinct structures. In order to highlight the distinction between communities of practice and innovation networks, each concept is firstly shortly defined. Innovation networks, referring to social networks, are sets of connections between people. These relationships and connections are used to solve problems, share knowledge, expand personal connections and ultimately to innovate. In effect the relationships within an innovation network are used as a

resource by all participating individuals in order to generate novel ideas which may lead to innovation. Communities of practice are defined within the rapport as a learning partnership among people around a specific domain. These people find it useful to learn from and with one another in order to steward knowledge of the particular domain. Together they address challenges they face individually and collectively, create a sense of community and, in the process, develop a shared body of knowledge (Wenger et al., 2011:9).

Innovation networks allow participants access, intentionally or unintentionally, to information flows and exchanges. These connections can be direct, through personal connections, or indirect, through a series of connections. Participating in a network does not require a sustained learning partnership or commitment to a shared practice, as in the case of a community. In other words, learning in networks does not require a clear collective facet. Innovation networks derive value from the access they provide to a large pool of information, which offers multiple perspectives, as well as responses and assistance from others. In networks, individuals can each gain access to specific learning resources through personal connections, or information flows can cut through connections in spontaneous and unpredictable ways based on individual's interpretation and propagation. Potential spontaneous and unanticipated connections within networks are the aspect that gives networks potential for learning and innovation (Wenger et al., 2011:11). Possible dangers include noise and diffusion. As participants further increase their connectivity, the chances of gaining access to useless as well as useful information also increases. Innovation networks therefore require the maintenance of connections and the ability to differentiate between useful information and 'noise'. On the other hand, the absence of collective intention and shared identity, makes stewarding a specific domain tremendously difficult. Resultantly, important insights can go unnoticed, seeing that no committed group exists to negotiate their importance. Innovation networks require a strong sense of direction from participating individuals which can prove to be a challenge. Learning within networks can only take place if individuals leverage available information in their pursued area of interest and continuously assess the relevance of information flows (Wenger et al., 2011:11).

Communities of practice create a social space in which a learning partnership can develop which relates to a commonly held domain. It is characterised by the merging of individual and collective learning in the process of developing a shared practice. This is where communities derive their value from. They have the ability to develop a joint commitment to advancing learning in a specific domain. Automatically the information flowing between



participants get focused on only relevant information. A shared practice, a shared repertoire of cases, techniques, tools, perspectives etc., also become a resource participants can utilise. Communities of practice risk becoming hostages to their established ways of doing things and resultantly become closed and inward-focused. Even past successes can blind participants to possible new opportunities. It is challenging to sustain a community seeing that they require continuous identification and engagement. Members should continuously negotiate and renegotiate the reasons for collective learning. They must help each other, follow up on ideas and create shared resources and a sustainable learning space (Wenger et al., 2011:10). All these requirements necessitate time and commitment from each member. The level of participation may differ, as long as there is enough commitment to keep the community alive (Wenger et al., 2011:11).

**Table 4-1 Communities versus Networks**

<b>Communities of Practice</b>	<b>Innovation Networks</b>
✓ Small, close-knit network of like-minded individuals	✓ Large, loosely connected network, consisting of several organisations
✓ Focus on specific domain	✓ No specific domain focus
✓ Jointly develop an shared practice	✓ Provide access to large amounts of information across various domains
✓ Can become closed and inward-focused	✓ Can lack collective intend and shared identity
✓ Requires continuous time and commitment from members	✓ Less time and commitment required as members act individually

In the end these two structures can co-exist in order to fulfil different work. Communities are required to develop the learning partnership which creates an identity around a commonly held domain. It needs to specify what the purpose is for learning together, what they can learn from one another and what they can achieve by doing so. Ultimately, communities are required to create a communal sense of trust and commitment. Innovation networks on the other hand, are required to optimise the connectivity among participants in order to improve the possibility for novel ideas and innovation to arise. Further, the extent and density of the

network must be increased by strengthening current connections and promoting new connections. Ultimately, a network's potential to give rise to unanticipated connections must be increased in order to gain access to information and knowledge otherwise inaccessible or unreachable (Wenger et al., 2011:12).

#### **4.2.2 Complementary Roles in Innovation**

Even though innovation networks and communities of practice are distinct structures, they are in many facets complementary and could coexist and develop together. As networks develop their interconnectedness, a sense of community may simultaneously develop and a community's desire to learn about a shared practice or domain can often lead to search for greater connectivity. Whilst networks and communities have different innovative effects their strengths and weaknesses are complementary. For this reason, Wenger et al. (2011:12) argue that communities and networks can correct for one another. He further points out that innovation networks may lack the self-awareness required for a sufficient level of collective intent, but by creating a shared identity through community building, these networks will be seen as entities with collective potential by its members. Thus, incorporating elements of a community of practice can enhance the effectiveness of innovation networks. Conversely, communities of practice may become closed and inward looking when its collective identity becomes too embedded. Incorporating network elements may prove to be beneficial, allowing new connections to redraw boundaries and bring in new perspectives. Thus, elements of innovation networks can also correct for certain downfalls found in communities of practice (Wenger et al., 2011:12).

In the end, the dynamic interplay of both processes enhances innovation capacity, by combing the focus of a community with the fluidity of a network. Individual and collective learning and innovation is interwoven in the process. Wenger et al. (2011:13) believe that organisations that foster innovation need to take advantage of this complementarity of communities and networks. Therefore, although innovation networks and communities of practice are distinct structures, they can in principle be described in the same language. The question remains now do innovation networks and communities of practice exactly complement each other with respect to innovation?

### **4.3 Innovation Process**

Innovation, for the purpose of the section, is very broadly defined as any new, useful and successful way of solving an articulated or previously unknown internal or external problem.

Innovation includes everything from product, service, business, organisation and management innovation among others (Pyka & Saviotti, 2002:81). Innovation is no longer thought of as solely an individual process, but it is rather recognised that it occurs most frequently during collaboration between organisations. The aim of cooperation and collaboration between organisations is to gain new information and knowledge in order to innovate, individually or collectively. Especially tacit knowledge, which is gained through the interaction between organisations, is an important source of innovation. Besides the possibility to gain new knowledge, organisations also embrace collaboration through networking based on the opportunity to share the costs and risks associated with major innovation. The common sense view of the innovation process in organisations is naively linear and assumes that the knowledge involved is a form of content that can be passed along and incrementally added to (Newell et al., 2009:188). This linear view is an oversimplification that assumes that the creation of new ideas is the most critical phase in the innovation process.

In contrast to this view, Newell et al. (2009:195) argue for a broader view of innovation consisting not only of the creation of new ideas, but also the implementation and diffusion of those ideas. This view of the innovation process assumes that knowledge is suited within practice and not easily altered without also transforming established practices. According to this view, innovation is a process consisting of several iterative, rather than linear, activities that involve complexity, uncertainty and political activity. The implication is that innovative activity does not have predictable outcomes, because chance and coincidence plays a role in whether new ideas take hold (Newell et al., 2009:194). Furthermore, innovations involve changes to organisational practices, making it highly context specific and the notion of universal innovative best practice problematic. This character of innovation shifts the focus of knowledge management to creating an enabling context for new combinations of knowledge and practices to form requiring sensitivity to the particular context and the specific purposes of the organisation (Newell et al., 2009:194). Therefore management must proceed with caution, because what is good for one organisation may be bad for another (Newell et al., 2009:183). If one accepts this broader view of the innovation process, communities of practice are central to successful knowledge creation.

Innovation is usually a very complex, uncertain and highly political activity, with many unpredictable outcomes along the way. Newell et al. (2009:195) state that the process of innovation is complex, because of its iterative design and decision process involving the

dynamic creation, diffusion and implementation of new ideas in different contexts. It is very difficult to know from the start what will be achieved when knowledge is combined in novel ways. It is sometimes even more difficult to get people to buy into the process of innovation and its outcomes (Newell et al., 2009:183). The innovation process concerns a lot more than just coming up with novel ideas as it also requires implementation, putting these ideas in practice; and diffusion, spreading them more widely across organisations. Only focusing on innovation as the invention of new ideas, as in the case of exploration and exploitation, is thus very limited (Newell et al., 2009:188). These activities interweave over time in practice in often unpredictable ways. Only coming up with new ideas without implementing them in practice does not qualify as innovation (Newell et al., 2009:189). Ensuring innovation, based on these three activities, has proven to be a challenge in practice as the process of innovation is not linear. Rather, innovation is a cumulative and iterative set of occurrences, actions and prosperous coincidences, where several actors, numerous forms of knowledge and organisational tasks interact, which usually lead to unintended outcomes (Newell et al., 2009:194). Modifications during implementation to the initial idea based on feedback illustrates that innovation cannot be realised through linear phases. Innovation is not a fixed entity with set parameters that can simply be implemented in practice. It often requires significant rethinking and modification so that it properly fits the features of a particular organisation. This means that innovation does not have predictable outcomes as it has an impact on many different areas of the organisation, influencing many internal individuals and groups (Newell et al., 2009:193).

Unintended outcomes of innovation are not uncommon, as participating actors active in different periods of time, attempt to influence the process in order to favour their particular knowledge and interests (Newell et al., 2009:197). This character of innovation forces innovation management to be more about creating an enabling context for such new combinations of knowledge and practices to take place (Newell et al., 2009:194). Innovation thus leads to changes in organisational practice, making it highly context specific and the notion of universally applicable best practice exceedingly problematic. The same goes for the optimal innovation structure, as it continuously changes depending on the context and as a result of innovation taking place (Newell et al., 2009:193). Consequently, it is obvious that managing innovation can be extremely challenging in practice. The processes used to manage knowledge work and innovation must be customised to a particular context and for its

specific purposes. Therefore, innovation management cannot be successfully attempted in a universalistic sense by a single best practice approach (Newell et al., 2009:183).

Some of the parts of the innovation process involve thinking and activities that are divergent in character and other parts of the process are convergent. In the literature on innovation divergence and convergence are discussed in terms of exploration and exploitation. Exploration and exploitation are relevant for different parts of the innovation process and the two may well require completely different forms of organising. Exploration's focus is on the discovery of novel ideas and knowledge which may lead to entirely new product, services, procedures and practices through radical innovation (Newell et al., 2009:53). Exploration increases the knowledge stock of an organisation or fills the gaps in the current knowledge base. The expected outcome of these processes is normally new ideas and beliefs, new knowledge, experimental products, new procedures, new routines, and new practices. Exploration relates to radical innovation, which leads to entirely novel products, services, procedures and practices (Gilsing, 2003:53). Exploitation, on the other hand, focus on the improvement of existing knowledge through incremental innovation, leading to the gradual evolution of products, services, procedures and practices (Newell, et al., 2009:54). The objective of exploitation is to improve or correct a few specific elements of the existing knowledge base. The expected outcomes of exploitation are an improved understanding of specific issues, improved products, process improvements, improved problem solving skills, and improved formal procedures. Exploitation is continuous modification leading to the gradual evolution of products, services, procedures, and practices (Gilsing, 2003:54). Exploration and exploitation can be facilitated by distinct structure which are characterised by several networks concepts. These network concepts are explored in the following section.

#### **4.4 Network Ties, Cognitive Distance and Absorptive Capacity**

Striking the optimal balance between exploration and exploitation in a given context will require a particular configuration of strength and density of ties, cognitive distance and absorptive capacity that support both processes. These concepts are well-established in the literature on networks and describe how networks are structured and the manner and extent of their innovation. Firstly, the strength and density of ties are discussed and how it influences knowledge transfer between partners. Networks can be composed of weak and strong ties as well as high or low density clusters, each with different innovation implications. Secondly, cognitive distance between the actors impacts on the efficacy of information and knowledge

diffusion inside a network. Thirdly, the role of absorptive capacity in the process of innovation is discussed, illustrating that a high absorptive capacity is required by network partners in order to consolidate knowledge transfer. In conclusion, aspects of communities of practice can also be described in these terms and looking at how communities and networks complement each other highlights the relation between strength and density of ties, cognitive distance and absorptive capacity.

#### **4.4.1 Strength and Density of Ties**

Granovetter (1973:1361) defined the strength of interpersonal ties as the combination of the time; emotional intensity; and intimacy invested in a relationship, as well as the nature of exchange that takes place between those involved (Ruef, 2002:429). In his influential strength-of-weak-ties argument, Granovetter (1973) showed that weak ties involve limited investment of time and intimacy whilst incorporating a wide range of acquaintances. He argues that weak ties are better equipped to spread information or resources than strong ties, because they connect otherwise disconnected social groups. In contrast strong ties are characteristic of close-knit networks where members hold similar information and consequently benefit less in terms of exposure to new information (Ruef, 2002:430). These ties are characterised by emotional bonds such as friendship, intimacy and mutual exchange, which tend to endure over time (Ashman et al., 1998:2).

Weak ties are associated with low-density networks, such as organisations participating in large heterogeneous networks are normally linked by weak and short-lived ties (Kehler, 2004:6). Weak ties tend to be more influential, less frequent and less intimate than strong ties. They usually form among people with diverse values, interests and ways of interacting which make it hard to find commonalities that foster and build trust (Ashman et al., 1998:2). Therefore weak ties lack the trust required to promote the exchange of tacit knowledge. As a source of diversity, weak ties provide access to both useful and useless information, necessitating the continuous differentiation between important information and 'noise' (Nooteboom & Gilsing, 2004:12). Because of their diversity and lack of cohesion, weak ties are more likely to be threatened by conflicts or domination (Ashman et al., 1998:2). When participants are connected by weak ties they most likely do not share much cognitive communality which raises the likelihood of misunderstandings.

For all their disadvantages weak ties provide organisations with access to a wide variety of new and diverse information (Kehler, 2004:6). By forming weak ties, organisations can gain

access to socially isolated groups with information and resources that may not be accessible otherwise (Ashman et al., 1998:2). Networks connected with weak ties are much less cohesive than tightly knit groups, but provide a much more effective platform for the flow of information and the spread of innovation than strong ties (Flache & Macy, 1996:3). Weak ties prove to be more useful in the search for scarce information and resources seeing that they provide links between diverse and otherwise isolated social groups (White, 2003:2). Innovation networks are platforms for innovation diffusion through inter-organisational collaboration. Inter-organisational relationships are most likely characterised by weaker ties when compared to stronger intra-organisational relationships between people who work together. An innovation network typically consists of a range of acquaintances mostly connected by weak ties. Innovation networks are equipped to spread information and can serve as bridges between organisations. Even though innovation networks are less cohesive than for example, communities of practice, they are more effective for information flow and innovation spread.

In contrast to weak ties, strong ties are formed in small networks, normally where similar actors interact frequently. These ties allow similar opinions to be confirmed, reducing access to new and diverse information (Kehler, 2004:6) and increasing redundancy (Ruef, 2002:430). It requires a lot of effort and time to maintain strongly tied relationships, which means that less time is available for the development of new ties, further limiting the ability to gain new insights. Strong ties may cause organisations to become locked in to established views and frameworks, reducing responsiveness to a changing business environment (Kehler, 2004:6). However, strong ties also have certain advantages as they allow organisations to develop in-depth interaction that promotes the exchange of detailed information and tacit knowledge. Strongly tied actors in close-knit networks are more inclined to trust each other, allowing them to work more closely together (Kehler, 2004:6). The strong connections and intimacy of relationships mean there is willingness among actors to assist each other, share information and learn from each other (Carolan & Natriello, 2005). Strong ties create boundaries between insiders and outsiders, which may lead to positive as well as negative effects, depending on the specific context (Ashman et al., 1998:2). Communities of practice are examples of close-knit networks connected by strong ties. They are formed based on a shared practice or an interest in a common domain. Community members know each other well, share homogenous information, interests, and perspectives. Relationships in communities endure over time based on trusting interactions around a shared practice or body of knowledge. The

shared practice fosters effective communication and mutual understanding among members, which enhances the strength of ties even further.

The density of ties in a network indicates the potential for cognitive variety present within the structure. Density of ties is defined as the “proportion of present ties to the total number of possible ties” (Gilsing, 2003:88). A network with many relations is considered to have a dense network structure. Dense structures enable the transfer of knowledge between organisations as the richness of the interaction promotes knowledge spillover. Dense ties allow networks to develop standards and norms, build reputation and trust, which leads to more cohesive structures and operations (Gilsing, 2003:62). Dense structures are characterized by frequent and rich interaction circulating a large amount of redundant information and knowledge. Networks can be more efficient by eliminating redundant ties and only keeping the necessary ones (Nooteboom, 2004:618), but at the risk of losing cohesion. Networks with few relations between actors are regarded as non-dense or sparse networks. They are limited in their ability to transfer knowledge and the creation of a common understanding seeing that there are effectively more distance within such a network and shared standards or norms, may be lacking. The diversity in these networks can be a source of both opportunity and constraint as it provides access to new information, but limits the cohesiveness of operations and practices utilising that information (Gilsing, 2003:62).

#### **4.4.2 Cognitive Distance**

Cognitive distance reflects diversity or similarity of knowledge between individuals or organisations that determines the potential for possible cooperation. Usually interaction emerges between heterogeneous organisations where complementary knowledge and capabilities can be combined and integrated (Gilsing, 2003:15). Nooteboom et al. (2007:3) believe that cognitive distance exists between people as they have developed along different life paths and in different environments. In other words, people interpret, understand and evaluate the world differently. This notion also applies to organisations which has an impact on collaboration. In order for organisations to work towards common goals they need to share certain perspectives and values which adequately align their competencies and motives. This is determined by the involved organisations’ degree of shared perception, interpretation and evaluation established by their organisational cultures. Differences in such organisational focus results in cognitive distance between the organisations involved (Nooteboom et al., 2007:1018). It is widely accepted that the effectiveness of cooperation has an inverted U-



shape in cognitive distance. If homogenous organisations are too close together, meaning that their knowledge bases overlap too much, it leaves little or none left for them to share. On the other extreme, if organisations are too far apart, meaning their knowledge bases barely overlap, organisations find it difficult to understand, communicate and share between one another. It is about finding a middle ground where the cognitive distance is not too much and not too little, the so-called optimal cognitive distance. Nooteboom and Gilsing (2004:6) argue that the optimal cognitive distance lies at the apex of the inverted U-shaped curve. Knowledge partnerships between organisations cause their cognitive ties to move closer together, seeing that their knowledge bases start to overlap continuously more as knowledge is shared between them. As organisations move cognitively closer together, they become less attractive to each other because they are more similar, leaving less to share in the future (Cowan et al., 2007:1053).

Cooperation between organisations can also be highly uncertain and risky, especially based on the reliability of the possible partner. Organisations can make use of two possible information sources in order to reduce the uncertainty during partner selection. Firstly, organisations can make use of past experience with a partner, which will possibly improve their ability to cooperate and yield information about the organisation. Successful collaboration in the past will provide organisations with a shared body of knowledge built up over time, also creating trust between participating organisations. In this sense, organisations prefer to work together with partners from the past. Secondly, organisations can make use of other organisations in their network as sources of information on possible partners. Organisations are more likely to work together with partners who have previously had successful partnerships with other organisations in their network. Consulting immediate contacts can be an effective source of information on the possible future partners (Cowan et al., 2007:1053). But research has shown that if two organisations continue to interact and learn from one another, their knowledge bases will eventually overlap too much, decreasing their strategic complementarity. This will hamper possible future interactions between these two organisations as their cognitive distance has become too small to make knowledge sharing worthwhile anymore (Cowan et al., 2007:1054).

Cognitive distance also determines the strength of ties required to effectively make use of relations. A large cognitive distance between organisations necessitates high investment in relationship building in order to create mutual understanding. On the other hand, small cognitive distance between organisations enables them to form relations based on weak ties

without the need for frequent and durable interactions (Nooteboom & Gilsing, 2004:8). Strong ties are associated with a small cognitive distance which enhances mutual understanding and facilitates the transfer of tacit knowledge. Networks with strong ties, approaching the negative relation of cognitive distance, enables the effective functioning of coordination mechanisms through norms, peer control and reputation. Strong ties, with a corresponding small cognitive distance, enhance the easy transfer of tacit knowledge, making it highly valuable in environments where knowledge is mainly tacit. Knowledge can only be integrated efficiently when organisations share a common understanding, maintain close relations, based on sufficient trust. This is only possible through strong ties with small cognitive distance (Gilsing, 2003:47). A community of practice is an example of a strong tie structure with a small cognitive distance between its members, making them effective platforms for the exchange of tacit knowledge.

To summarise, it appears that there are inherent dangers within strong ties besides its advantages. Firstly, exclusivity, together with established norms and reputation, can regulate internal behaviour too strictly. The importance of conformity may discourage any deviation from the established way of doing things. In such networks, barriers to outsiders may exist, obstructing entrance of new members or the renewal of the structure. Such cognitively close networks may cause it to become locked-in, rendering it blind to alternative information or practices (Gilsing, 2003:47). In such situations, looser ties may be required with greater cognitive distance. Such structures provide room for knowledge sharing and mutual learning to take place. An increase in cognitive distance leads to the increase in novelty, but results in the decrease in absorptive capacity as organisations find it difficult to understand completely new information and knowledge. Thus, increasing cognitive distance poses both an opportunity and a problem (Nooteboom et al., 2007:1023). Innovation networks are examples of more loosely structured networks with greater cognitive distance. However, some dangers may also be associated with more cognitively distant structures. When the cognitive distance between partners is too large, it becomes too difficult to understand and communicate, leading to absorptive difficulties, negatively impacting their ability to learn from one another (Gilsing, 2003:46).

#### **4.4.3 Absorptive Capacity**

According to Cohen and Levinthal (1990) absorptive capacity refers to one of an organisation's fundamental learning processes, specifically it is an organisation's ability to

identify external information and knowledge of value, assimilating and utilising it (Cohen & Levinthal, 1990:128). More specifically, absorptive capacity is firstly an organisation's ability to recognise the value of new external information and knowledge which is determined by its cognitive structures. After relevant information and knowledge have been identified, it must be assimilated into the organisation. Lastly, this new knowledge must be used by the organisation by applying it to commercial ends (Cohen & Levinthal, 1990:128). The recognition and assimilation aspects of absorptive capacity have an impact on an organisation's knowledge acquisition, whilst utilisation is linked to organisational performance (Volberda et al., 2010:933). Taking acquisition and performance together, an organisation's capacity to absorb knowledge is crucial for making full use of external knowledge sources (Volberda et al., 2010:931).

An organisation's innovative ability is depended on both external and internal knowledge. Organisations are required to tap into external knowledge, but also create new knowledge internally. Thus an organisation's capacity to absorb knowledge has become crucial (Volberda et al., 2010:931). Research and development has a positive relation towards absorptive capacity. Research and development enables organisations to gain some of the tacit skills needed in order to absorb knowledge generated by others. High levels of investment in research and development allow organisations to deal with a large cognitive distance which may exist between partners or potential others (Nooteboom et al., 2007:1025). Besides research and development, it is required that organisations make specific investments in absorptive capacity in order to generate mutual understanding and establish trusting relationships. Trust is required as a result of the possible risk of unintended knowledge spill over. Knowledge can be lost which is part of an organisation's core competencies, quite possibly resulting in the loss of the organisation's competitive advantage (Nooteboom & Gilsing, 2004:6). Consequently, organisations need to develop and maintain their absorptive capacity, seeing that it can strengthen, complement, or transfer the organisation's knowledge base (Lane et al., 2006:833).

Cohen and Levinthal (1990) and practically all the succeeding literature on absorptive capacity, argue that an organisation's absorptive capacity is largely dependent on its prior knowledge endowments. More specifically, it has been argued that an organisation's learning potential for absorptive capacity is primarily determined by prior related knowledge and research and development investments. This has been termed the cumulateness feature, where previous knowledge and investments enhance the learning and absorptive ability of

related knowledge in the future. Absorptive capacity thus accumulates over time as learning and absorptive ability is expanded. This is supported by a wide range of empirical evidence (Ahuja, 2000<sup>9</sup>; Lane & Lubathin, 1998<sup>10</sup>; Powell et al., 1996<sup>11</sup>; Stuart, 1998<sup>12</sup>), showcasing that people's ability to absorb knowledge is enhanced when they have some sort of previous or common knowledge in terms of expertise, training or background information (Volberda et al., 2010:933). Based on this assumption, communities of practice will generally have a high absorptive capacity. They focus on a specified domain and develop a shared practice over time. Consequently, members of a community of practice all share prior knowledge, making the efficient absorption of related knowledge significantly more likely and easier. This will result in the expansion of communities of practice's absorptive capacity, leading to the effective absorption of future related knowledge. Innovation networks, on the other hand, do not normally possess a shared knowledge base of prior created knowledge. In this sense, they will tend to struggle, more than communities of practice, when it comes to absorptive capacity.

Absorptive capacity not only depends on current knowledge, but also requisite variety in terms of diverse backgrounds is needed to ensure that people make novel associations and linkages that spark innovation (Volberda et al., 2010:934). Thus from a perspective of efficiency of innovation, requisite variety is as important a consideration as overlapping knowledge bases. Innovation networks connect people from different organisations and possess more variety than communities of practice do. However, on an inter-organisational level, absorptive capacity correlates with similarity between organisations. The absorptive capacity of organisations with similar knowledge bases, organisational structures, practices and perspectives tend to be higher compared to organisations that are very different from each other (Volberda et al., 2010:934). For this reason innovation networks may lack

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<sup>9</sup> Ahuja (2000) identifies three forms of accumulated capital, namely technical, commercial and social that can affect an organisation's incentives and opportunities to form linkages with other organisations. It was shown that organisations that do possess these capital stocks are better able to form inter-organisational linkages.

<sup>10</sup> Lane and Lubathin (1998) argue that one organisation's ability to learn from another organisation is argued to depend on the similarity of both organisations' knowledge bases, organisational structures and compensation policies, as well as dominant logics. These all were shown to be positively related to inter-organisational learning.

<sup>11</sup> Powell et al. (1996) argue that when the knowledge base of an industry is both complex and expanding and the sources of expertise are widely dispersed, as in the case of the biotechnology industry, the locus of innovation will be found in networks of learning. Consequently, inter-organisational networking is the result as organisations strive to access knowledge which is not confined to the boundaries of one organisation.

<sup>12</sup> Stuart (1998) argues that organizations in crowded positions are those that participate in technological segments in which many firms actively innovate, and prestigious firms are those with a track record of developing influential inventions. The study's principal empirical findings are that firms in crowded positions and those with high prestige form alliances at the highest rates.

sufficient absorptive capacity. Communities of practice, on the other hand, may tend to have more absorptive capacity than innovation networks.

#### **4.5 Optimal Innovation Structure**

Nooteboom and Gilsing (2004) are some of the first theorists exploring the possibility of local optimality in network structure. This is done by looking at exploration and exploitation and how these processes are facilitated by strength of ties, cognitive distance and network density. Exploration entails the development of novel practices, while exploitation entails improvements to established practices (Nooteboom & Gilsing, 2004:2). It has been shown that there is no such thing as a universally optimal network structure best suited for every situation, but that the appropriateness of network structures is highly dependent on the environmental and specific context. It is generally accepted that optimality cannot exist universally for every network in every situation. Optimality is thus local instead of universal as it is subject to the specificities of the environment in which the network is embedded (Gilsing, 2003:27). Hence, the possibility of an optimal network structure seems to be liable to the specific context (Gilsing, 2003:87). This raises the possibility that every situation has an optimal network structure which best suites it operations.

Following the same logic as Nooteboom and Gilsing (2004) the thesis explores the possibility of creating an optimal innovation structure. An optimal innovation structure within a specific scenario is very elusive, because the required structure changes throughout the lifecycle of a project. Organisations are faced with a challenge; on the one hand they need to develop an in-depth understanding of existing and newly emerging fields within their environments. On the other hand, they need to keep a broad focus on new possibilities, allowing them to maintain access to these options in the future. In order to balance these requirements, organisations need to promote both exploration and exploitation.

However, providing the correct enabling context for both processes to take place simultaneously requires a trade-off. A certain type of structure is required to effectively facilitate and support exploration. A loose network structure, accompanied with loose and informal forms of coordination can enhance exploration. Exploration requires weak ties in order to bridge structural holes within networks for the effective utilisation of novel opportunities (Nooteboom, 2004:616). Furthermore, a dense network structure, built up of weak ties can also positively affect the process of exploration (Gilsing, 2003:89). Dense ties are required during exploration because of the high levels of uncertainty associated with

radical innovation. Organisations may be unaware of which knowledge and consequently which sources of knowledge, are relevant. This forces exploration networks to maintain many, likely redundant ties, in order to ensure that all necessary knowledge can be obtained. Furthermore, redundant ties may be needed as the organisations within the network must make sure that they secure access to relevant knowledge sources over a long period as sources may leave the network or cease to exist. Lastly, exploration requires dense ties in order to help organisations bridge cognitive distances between them, as a third party may help facilitate mutual understanding between two organisations. This can be done by either supplementing absorptive capacity or verifying the accuracy of information (Nooteboom, 2004:619). Redundancy in ties during exploration can consequently be justified as the cost of redundancy is normally lower than in exploitation. This is because the investment in weak ties required for exploration is must lower than required for strong ties associated with exploitation (Nooteboom, 2004:620).

These loose structures must usually consist of heterogeneous organisations in order to ensure a great deal of diversity and cognitive variety. To bridge cognitive distance between organisations, they need to make investments in mutual understanding without which knowledge exchange or spill over will be useless (Nooteboom, 2004:616). Diversity has been shown to positively affect innovation potential. Resultantly, exploration requires a large cognitive distance which provides the necessary diversity in information and knowledge required for radical innovation. According to Nooteboom (2004:621) the duration of an exploration network should be short, as long-term networks will reduce flexibility and lead to too much reduction of cognitive distance. Short duration should furthermore be accompanied by high frequency of interaction in order to accommodate the speed of development necessary for radical innovation. Radical innovation through exploration is based on a model of high risk, high reward which is usually attempted for reasons such as a threat of bankruptcy or major competition in the industry (Gilbert et al., 2007:107). Attempting to promote radical innovation has been reported to show very little success rates, even as low as five percent presented by Gilbert et al., (2007:107). Countering the risk of failure during exploration requires organisations to simultaneously pursue exploitation processes possibly leading to continuous breakthroughs by incremental innovation.

Exploitation, on the other hand, also requires a certain type of structure which facilitates and supports exploitation more efficiently. Strong ties are better equipped to fulfil the information and search-process requirements. Durable and strong ties enable the continuous search for

and development of specific information and knowledge around selected topics. In order to improve efficiency, redundant ties must be eliminated, necessitating less-dense structures (Gilsing, 2003:92). Non-dense network structures are required as the cost of redundancy can have a major negative impact on the success of exploitation. Competitors provide the similar products and services leaving cost to play the defining role in an organisation's competitiveness. By this stage organisations within networks will also know which knowledge, as well as knowledge sources, is relevant for exploitation. This allows organisations to maintain only the necessary ties, eliminating redundancy. Exploitation is thus more suited for stable, non-dense networks with a long lifespan (Nooteboom, 2004:620). Long-term networks aimed at exploitation have a lesser need for frequent interaction as innovation takes place incrementally over a long period of time. These networks are built on high levels of trust with low cognitive distances, together facilitating the transfer of tacit knowledge and ultimately innovation (Nooteboom, 2004:621).

In the end, exploitation requires non-dense networks with strong ties in terms of durability. Strong ties, based on long-term and relatively frequent interaction, results in small cognitive distances between participating organisations. This will help facilitate the effective exchange of tacit, context specific, knowledge throughout the network. These structures allow effective specialisation and coordination to take place which supports incremental adaption and innovation (Gilsing, 2003:93). Consequently it can be seen that conflicting network structures are required for exploration and exploitation. The network attributes required for exploration and exploitation are summarised in table 4.2. It seems like the network structure required for exploitation is the complete opposite of the one required to support exploration (Harryson et al., 2008:749). This raises concern for how such opposing structures can be consolidated in order to facilitate both processes.

**Table 4-2 Network attributes which promote exploration and exploitation**

	<b>Exploration</b>	<b>Exploitation</b>
<b>Strength and Density of Ties</b>	Weak (more dense) Ties	Strong (less-dense) Ties
<b>Cognitive Distance</b>	Medium to Large	Small to Medium
<b>Absorptive Capacity</b>	Low to Medium	Medium to High

Structurally innovation networks correspond strongly to the structural required need for exploration to take place. Communities of practice, on the other hand, seem to be structurally equipped to promote and support the process of exploitation. Subsequently, it can be deduced that innovation networks and communities of practice have differing but complementary roles in creating and discovering novel ideas and knowledge. Besides their possible roles in exploration and exploitation, these two structures may also promote the other activities required for innovation to take place. These activities are the implementation and diffusion of novel ideas and knowledge. Innovation can only take place if newly created or discovered knowledge is implemented in practice and widely shared or diffused to all the relevant parties involved. The complementary roles innovation networks and communities of practice can play in the innovation process create the possibility that combining their two structures may lead to improved innovation. In other words, by combining the benefits of a community of practice's strong ties with the benefits of an innovation networks' weak ties, organisations may be able to improve the innovation performance depending on the context. These combined structures may provide organisations with the opportunity to move closer to the optimal innovation structure in every context. To reach the optimal innovation structure, the process will firstly require both aspects of exploration and exploitation. A more in-depth discussion on the role of innovation networks and communities of practice in the innovation process is the focus of the next section.

## **4.6 Combining Communities and Networks**

### **4.6.1 Roles in the Innovation Process**

When perceiving innovation through a process perspective as argued by Newell et al. (2009), one will start to see why organisations require both elements of innovation networks and communities of practice in order to improve innovation. Innovation networks seem structurally equipped to promote, facilitate and support exploration as well as, to a large extent, diffusion of knowledge and innovation. Innovation networks are closely related to exploration, seeing that their main objective is also to create new knowledge which leads to innovation. They are also effective structures for the large-scale diffusion of information, knowledge and innovation between all the partner organisations involved in a network. Innovation networks generally also correspond to the appropriate structure for the facilitation and support of exploration discussed in section 4.5 and summarised in table 4.2. Innovation networks are usually characterised as loose structures, governed by more informal procedures.

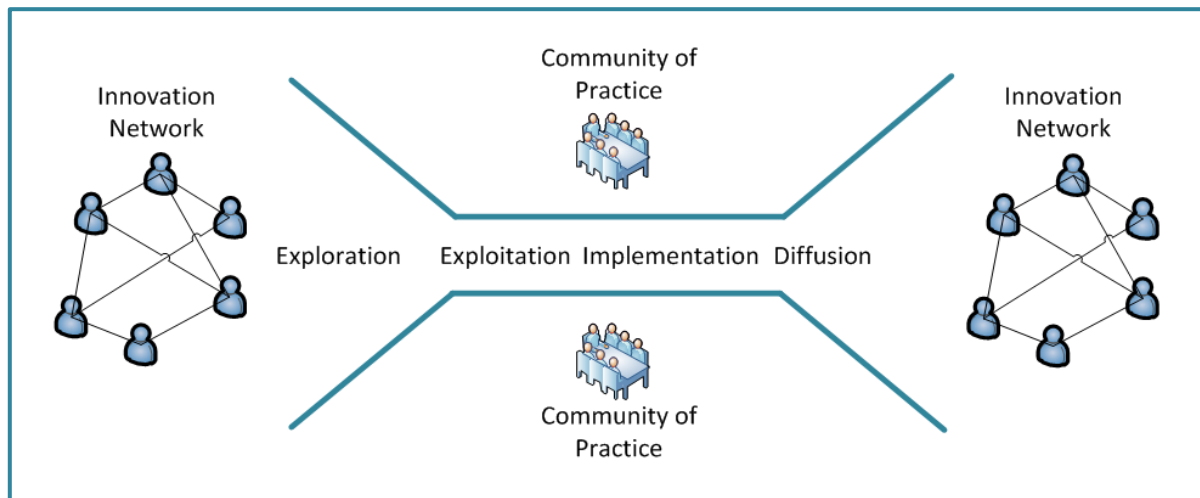


They are large networks, possibly stretching a number of smaller networks, ensuring dense structures. Based on the vast amount of ties active in an innovation network, these ties tend to be predominantly weak. Innovation networks comprise of heterogeneous organisations to ensure a large amount of diversity and cognitive diversity, which is needed for innovation. Innovation networks therefore usually have a large cognitive distance between participants. They however do not possess the structural attributes in order to promote the activities of exploitation and implementation.

Consequently, communities of practice are required seeing that it has been shown that they normally structurally equipped to promote, facilitate and support the activities of exploitation and implementation. Communities of practice distinctly relate to exploitation as they also aim to continuously improve on their existing knowledge base by incremental innovations. The appropriate structure for exploitation discussed in section 4.5 and summarised in table 4.2, also strongly correspond to the structural elements of a community of practice. Communities of practice are also characterised by strong, long-term relationships based on frequent interaction. They are usually small, durable, networks with a limited amount of ties. This corresponds to the need for less-dense structures in order to ensure efficiency with no redundant ties. Strong ties, with a shared practice developed over time, ensures a small cognitive distance between participants. This provides the platform for the effective transfer of tacit knowledge which is required for the understanding of specific topic and incremental innovation within them. Furthermore, communities of practice also support the implementation and diffusion activities of the innovation process. Exploitation is strongly connected to implementation as exploiting knowledge and ideas require the implementation of them in practice. Communities of practice are also able to implement and on a small-scale diffuse innovation seeing that they are embedded in practice. Communities of practice concern themselves with knowledge and innovation that can be applied in practice, in contrast to innovation networks which only focus on the transfer and diffusion of ideas and possible innovations.

Subsequently, it can be seen that both innovation networks and communities of practice are required for successful and even improved innovation to take place. These overlapping roles which networks and communities can fulfil in the innovation process can be seen in the model presented in figure 4.1. Even though the process can be seen as linear in the model, this is not the case in practice as these activities take place simultaneously, continuously, reoccurringly and unpredictably. The function of the model is only to show to which

activities innovation networks and communities of practice relate respectively and how they all interrelate in the process of innovation.



**Figure 4-1 Roles of networks and communities in the innovation process**

The three activities of the innovation process, including exploration and exploitation, required completely different, even opposing, structures and it is believed that innovation networks and communities of practice may provide these two distinct structures. But this provides the possibility to combine these two structures in an optimal way that can provide a optimal innovation network which facilitates the advantages of all the activities simultaneously, together with the minimisation of their disadvantages. In order to create an optimal innovation structure between the structures of an innovation network and a community of practice, in a given context, will require the establishment of the optimal strength and density of ties, cognitive distance and absorptive capacity in order to support and facilitate both exploration and exploitation simultaneously.

The strength of ties within such a structure may vary according to the context. Highly systematic networks require a large network size and high density. More stand-alone activities require smaller and sparser network structures (Nooteboom & Gilsing, 2004:8). Having access to diverse and novel information and knowledge is critical for innovation. This implies that organisations should maximise weak ties in their networks. But this is not the case for various managerial and cognitive reasons. Managerially there is a limit to the number of weak ties organisations can manage in addition to their strong ties. Cognitively, the chance of misunderstanding increase when cognitive distance becomes too large, thus implying that there is a maximum number of weak ties a network can handle. There seems to be a general agreement in the innovation literature that loosely connected networks, built up of strong and

weak ties, provide fertile ground to nurture learning and innovation. Consequently, this implies that there may be an ideal level of strong and weak ties and that this optimal mix is depended on the given environmental context (Gilsing, 2003:48).

The same goes for cognitive distance and absorptive capacity where the challenge is to find partners with an ideal cognitive distance and sufficient absorptive capacity. This is where they have something novel to provide, but still share enough in common in order to ensure mutual understanding. Seeing that exploration and exploitation are fundamentally different, cognitive distance is expected to have a different impact on the two types of learning. The novelty value of cognitive distance is higher when innovation is more radical as in the case of exploration, in contrast to exploitation. Thus the optimal cognitive distance for exploration will tend to be larger than in the case of exploitation. In the same sense an innovation network's optimal cognitive distance will tend to be larger than the one required for a community of practice (Nooteboom et al., 2007:1019). The novelty effect increases with larger cognitive distance, but a larger cognitive distance results in a decrease in absorptive capacity. Consequently, exploration requires a lower absorptive capacity than exploitation and the same goes for innovation networks and communities of practice. Higher absorptive capacity associated with communities of practice allow them to be better equipped than innovation networks to absorb, implement and diffuse new knowledge and innovation in practice (Nooteboom et al., 2007:1026). Thus, combing the structures of innovation networks and communities of practice in the best possible way, according to strength and density of ties, cognitive distance and absorptive capacity, may provide the optimal innovation structure, for a given context, which may lead to the maximisation of innovation in a specific situation.

#### **4.6.2 Theoretical Resources and Practical Limitations**

Now that it has been illustrated why organisations need elements of innovation networks and communities of practice in order to improve innovation, the question becomes how actually would one combine these two structures. It is still not known for sure, how these seemingly opposing structural elements can be combined in one structure in order to promote and facilitate all the activities required in the innovation process simultaneously. Consequently, organisations are faced with special challenges for organising innovation. The challenge is striking a balance between these two structurally opposing mechanisms for promoting, facilitating and supporting innovation during inter-organisational collaboration. It is believed that the theoretical answers to this challenge are already available in the literature. It is just a

matter of bringing the right concepts together, in the correct manner, for every specific context. Possible elements of the solution to the challenge will be covered in the next section, showcasing how they can contribute, but also how they are not complete solutions by themselves. The chapter concludes by investigating the practical challenges and limitations of combining innovation networks and communities of practice based on their distinct structural characteristics.

#### **4.6.2.1 Theoretical Resources**

This section explores possible concepts or phenomena which may assist in bringing us closer to connecting innovation networks and communities of practice. It has already been shown in this thesis that we can discuss communities of practice in the language of networks as they can be seen as a special kind of network. Therefore, one possible solution in order to connect innovation networks and communities of practice is the concept of boundary spanning. Boundary spanners are individuals who are able to bring people together across traditional boundaries by convincing them to work together towards a common goal and building lasting relationships (Ansett, 2006:37). Such individuals do not necessarily need to be occupying a leadership position in their organisation and are in fact often hidden within groups and organisations. Ansett (2006:38) states if successful partnerships are investigated, one will invariably find one or more individuals that assumed the role of boundary spanning. These roles are often also referred to as knowledge brokers, which are similar to boundary spanners with similar objectives to bring knowledge from where it is abundant, to where it is most needed in order to enable workers to perform their tasks better (Johri, 2008:8). Some even refer to boundary spanners or brokers as new types of leaders which will play an increasingly crucial strategic role in their respective organisations in the future (Ansett, 2006:38).

Understanding the complexity and demands of boundary spanning roles and realising the value they may bring to the organisation will force management to facilitate these positions in order to improve innovative partnerships (Ansett, 2006:44). Boundary spanners are required to operate outside their organisational boundaries by interacting with others who fulfil the same role in the external environment. They aim to expand the boundaries of their organisations by bringing them closer to other organisations through identifying strategic overlap and common objectives. These individuals aim to become the links between two or more organisations by maintaining relationships within their own organisations and other possible partners (Ansett, 2006:38). In order to be successful boundary spanners, individuals

require a highly specialised skills set, as well as the ability to create common language between partners for the effective development and implementation required for innovation. They require a vast amount of soft skills, often referred to as emotional intelligence, which have been increasingly recognised as fatal for effective management today. Ultimately, if boundary spanners perform their tasks effectively, the outcomes can lead to innovations in organisational strategy, processes, products and services (Ansett, 2006:39).

Boundary spanners and knowledge brokers however do not provide the complete solution to how innovation networks and communities of practice can be combined structurally as they normally operate on a certain horizontal level. Boundary spanners are usually effective in linking organisations which are in the same industry or to some extent similar. Resultantly, boundary spanners can be effective in linking similar innovation networks or similar communities of practice, but will struggle to cross between innovation networks and communities of practice as they are on different levels. A boundary spanner can be a member of two similar innovation networks, facilitating the interacting and collaboration between these two networks as they share common objectives. The same applies to different communities of practice, as dual membership can promote partnerships. However, people can be members of both communities of practice and innovation networks where they can act as boundary spanners, but this will prove more challenging. Innovation networks and communities of practice operate in very different ways and require even opposing structures rendering the integration of them beyond the normal role of boundary spanning or brokering. The dilemma is visually illustrated in figure 4.2, by showing that linking a community of practice with an innovation network will require a special kind of boundary spanning.

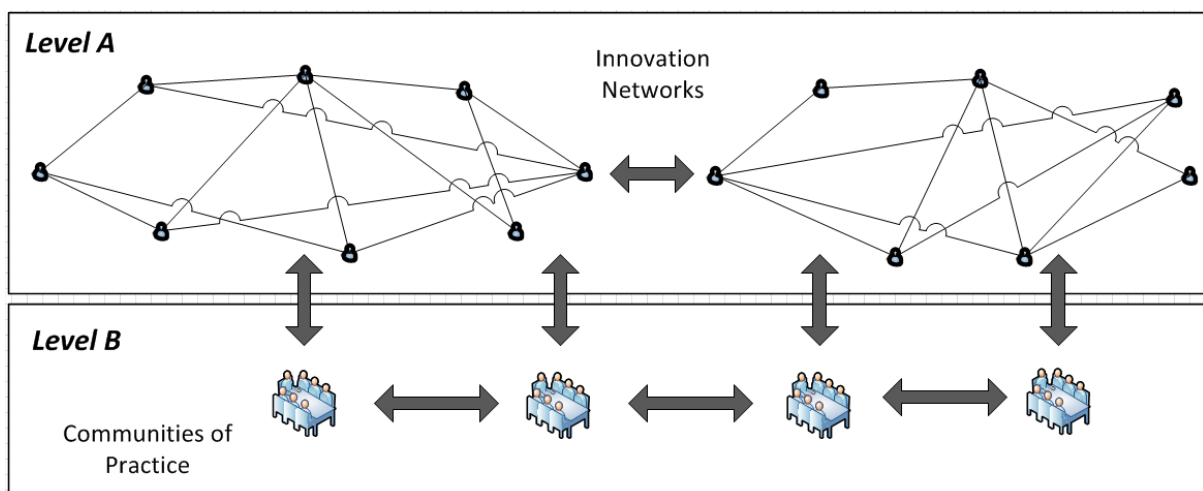


Figure 4-2 Challenge for boundary spanning between networks and communities

Members of communities of practice undertake projects in order to improve their specific domains or practices. This unintentionally results in smaller cognitive distances between members in a community of practice as their shared knowledge base evolves over time. Subsequently, the cognitive distances between members of communities of practice and innovation networks increase, causing learning boundaries between these two types of structures. Learning boundaries can result as the new shared practices developed at the community level are very different from the practices in innovation networks (Newell et al., 2009:108). This may cause a wider shift in cognitive distance between communities of practice, as well as innovation networks involved. Learning boundaries will make it very difficult for people in innovation networks to learn from the projects undertaken in communities of projects even if they are members of both types of structures. Boundary spanners will thus find difficulty in providing bridges between communities of practice and innovation networks as a result of shifting cognitive distance (Newell et al., 2009:109).

Another network concept which may assist in connecting innovation networks and communities of practice is clustering. Clusters tend to form within networks as some groups of organisations tend to link more strongly with one another than with others in the wider network. Several mechanisms encourage clustering, but the two most common mechanisms are based on similarity or complementarity between organisations. Organisations that share some type of proximity or similarity tend to interact more intensely or frequently which results in a high degree of clustering. Dense ties between organisations in a cluster increase the diffusion of alternative perspectives and develop a common understanding which stimulates collective problem solving. Ultimately, clusters can give rise to trust, mutually beneficial norms and a shared identity (Schilling & Phelps, 2007:1114). Intense interaction among partnered organisations, based on trust, transparency and mutually beneficial exchange, all enhance the possibility for the exchange of tacit or embedded knowledge (Schilling & Phelps, 2007:1115). Logically, it can be seen that communities of practice share some characteristics of cluster as they also possess strong ties, based on trust, where a mutual identity, norms and practice form over time between participants. Consequently, innovation networks and communities of practice can possibly be combined where the innovation networks represents the wider network and communities of practice the clusters within that network.

However, all clusters are not forms of communities of practice as they require commitment to a domain, a sense of community and a developing shared practice. Communities of practice

can form as clusters in networks, but one must be careful to consider every group of strong and dense ties as a community of practice. Furthermore, clustering usually involve many redundant ties between the same organisations. It can also create standards and norms which may limit the amount of experimentation and creativity within innovation networks (Schilling & Phelps, 2007:1115). Forming clusters within a network is costly, causing a trade-off between forming dense structures or loose links between larger numbers of organisations in the network. It's a trade-off between facilitating rapid exchange and integration of knowledge versus having access to diverse perspectives, information and knowledge. More recent research has shown that networks can provide both these advantages simultaneously by fostering strong clusters with a number of links between them serving as bridges. Bridges allow diverse information and knowledge to circulate between different clusters within a network or the wider network as a whole, which facilitates the existence of clusters as appose to causing a trade-off (Schilling & Phelps, 2007:1115). Bridges correspond strongly with the idea of boundary spanning which illustrates that a combination of solutions is required to combine networks and communities. Consequently, bridges or boundary spanners may be possible solutions in order to show how different clusters can be linked with one another and resultantly with the rest of the wider networks. The same goes for communities of practices which may exist as clusters within the wider innovation network.

Resultantly, clustering, which normally takes place spontaneously, may provide some explanation to how innovation networks and communities of practice can be structurally combined in one large network. However, it cannot provide a complete solution for a couple of reasons. Firstly, clustering is yet again a network concept which is applied on the theory of communities of practice. Thus far, utilising network concepts in order to explain communities of practice have not caused must of a problem, however the limitations of such an application must still be kept in mind. Secondly, relating communities of practices with clusters may prove to be more difficult. Structurally these two concepts share certain similar characteristics, but their level of operation differs. Clusters are composed of a number of organisations forming strong ties, where inter-organisational communities of practice are usually made up out of individuals form different organisations. Thus, clusters are on the organisational level, where organisations interact with one another; and communities of practice operate on the individual level, stretching across organisational boundaries. Ultimately, it can be deduced that there is no outright answer to the theoretical question of how innovation networks and communities of practice can be combined. However, the

answer seems to lie somewhere between various possible solutions, some of which I have touched on in the section. Organisations will be required to find the appropriate balance between these possible facilitating mechanisms. This brings us to the problem of connecting communities of practice and innovation networks in practice.

#### **4.6.2.2 Practical Limitations**

The possibility of creating an optimal innovation structure for every scenario by combining innovation networks and communities of practice poses new challenges for management practice. Communities of practice are autonomous and essentially self-organising, but are sensitive to subtle managerial interventions. Whereas innovation networks are more conducive to stronger and more direct management approaches. These two types of structures consequently exhibit different sensitivities to management which requires management to be more hand-off when trying to facilitate their creation and development. Subsequently creating an optimal innovation structure, just as innovation networks and communities of practice individually, requires organisations to create an enabling context for it to thrive in. This means that management can no longer try and control the creation and development of every organisational activity, but must rather cultivate such activities (Newell et al., 2009:178). Management is moving away from micro-managing activities to creating the right environment in which innovation structures such as innovation networks, communities of practice and the possible optimal innovation combination of the two can develop. It all comes down to identifying the most enabling context for knowledge work, providing the knowledge workers with significant autonomy do develop the correct networks and communities themselves. The processes used to manage knowledge work must be tailored to the specific situation, the purposes and the context (Newell et al., 2009:183). Just how innovation networks and communities of practice in practice can be combined in order to move closer to an optimal innovation structure is beyond the scope of this thesis, but poses a valuable opportunity for future research.



## **CHAPTER 5**

## **5 CONCLUSION**

### **5.1 Introduction**

The thesis set out to investigate the possible approaches to effectively stimulate and support innovation, in the best possible way, as we move into a radically new business environment. The fact that organisations need to continuously innovate in order to stay competitive has led to the need to find the best possible innovation structure, in every context, to facilitate and support innovation. The thesis was based on the assumption that innovation is increasingly spawned in networks, between several organisations rather than within one single organisation. Resultantly, the thesis looked at learning and innovation that take place at the network level, rather than in one organisation or at the individual level. The investigation looked at two different and to a certain extent opposing, fields of theory, innovation networks and communities of practice which can both be used as structuring mechanisms to facilitate and support knowledge work and innovation. The thesis set out to illustrate firstly that these two structures should not be seen as opposing, but rather as distinct structures with complementary learning and innovative effects which may correct for one another.

The aim was to see whether the two distinct structures can be combined in order to maximise innovation in every scenario. This was done by discussing the optimal network structure, popularised by Nooteboom and Gilsing (2004), to which organisations can strive for in every scenario. The optimal network structure is determined by several network concepts, namely strength and density of ties, cognitive distance and absorptive capacity. These concepts also apply to innovation networks and communities of practice as they both are also networks by definition. Innovation network and communities of practice, based on the three network concepts, have differing, but complementary effects on innovation. It was argued that organisations can take advantage of both structures' strengths and allow them to marginalise their shortcomings as they correct for one another. Consequently, the thesis set out to show that by combining the structural elements of an innovation network and a community of practice, according to a specific situation, may allow organisations to move closer to the optimal innovation structure for improving innovation in every context.

#### **5.1.1 Innovation Networks Review**

Innovation networks are structures that facilitate and support innovation between organisations. This is shown through an in-depth discussion on the value, structure, partner

selection, role of trust and downside of innovation networks. The value of innovation networks in terms of innovation are investigated by discussing the advantages of these structures. This illustrates that innovation networks may play a major role in an organisation's competitiveness and may even provide an organisation with a competitive advantage. We saw that some sort of networking is of extreme importance for all organisations in today's global business environment as they are effective tools for the promotion of innovation performance. Whether an innovation network is the right kind of networking structure depends on the organisations, markets, industries, environment and context involved. Different types of innovation networks exist and vary according to many characteristics and elements. The structural diversity of innovation networks are matched by the various reasons for their existence. We saw that the formation process of these network structures are not set in stone, causing the facilitation and maintenance of such structures to be extremely challenging. Innovation networks resultantly require a certain type of management capabilities to sustain these structures' innovativeness. The effective management of innovation networks has been shown to require the correct partner selection as well as the promotion and establishment of trust between these partners.

Besides the advantages of innovation networks, it was shown that they also hold various shortcomings and downfalls as they are not perfect networking structures without any possible dangers or dark sides. In order to make sure both sides of the coin was investigated, the chapter concludes with a look at the critiques that exist on the theory and practice of innovation networks. These critiques highlight the possibility that innovation networks may be unnecessary structures to investigate or even worthless for organisations and their quest for improved innovative performance. It was shown that besides the critique on and shortcomings of innovation networks, they are still one of the only tools which allow organisations to search and discover new ideas and knowledge without which exploration and consequently innovation will not be possible. They however do not fulfil the requirements for effective exploitation to take place which makes innovation networks unable to reach the best possible innovation performance on their own. This highlighted the importance of the next chapter of communities of practice as a viable solution to this shortcoming.

### **5.1.2 Communities of Practice Review**

Communities of practice are valuable organisational structures for the facilitation and support of knowledge work and innovation. Communities of practice were examined through Etienne

Wenger's perspective as he is one of the pioneers who coined the concept. Not all communities can be considered communities of practice, but need to fulfil three main requirements, namely commit to a domain; establish a sense of community through interpersonal relationships; and develop a shared practice over time. It was shown that communities of practice derive their value from their ability to drive strategy, generate new business ideas, solve problems, promote the spread of best practices, develop professional skills and help organisations recruit and retain talented workers. Structurally, it was shown that they may take many forms and vary widely in both name and style. It was also shown that communities of practice cannot be established and exploited by traditional managerial methods based on control and obedience. Organisations rather have the opportunity to cultivate these structures through various methods which require effective management. Furthermore, the chapter showed that they can be applied in an inter-organisational context over and above the usual intra-organisational context in which they are normally applied.

It was shown that communities of practice also have shortcomings highlighting their double-edged sword characteristic. Some of these shortfalls are unavoidable, but Wenger firmly states that communities of practice' possible benefits outweigh the downsides. The chapter concludes with a discussion on the three main critiques that exist on Wenger's theories. All three lines of critique pose a threat to the legitimacy of communities of practice, however Wenger's counter arguments is shown to be more than satisfactory. Besides all the possible shortfalls, downsides and critiques, communities of practice are still effective structures for the promotion and support of knowledge work. Even though they are not particularly equipped to search and explore new knowledge outside the community or its domain, they can be extremely effective in exploiting existing knowledge. Communities of practice have been shown to be effective in exploitation, implementation and diffusion of novel knowledge and innovation, making them extremely useful for an organisation's innovation process. These strengths complement the process of exploration and discovery facilitated by innovation networks discussed in chapter two. The relation between communities of practice and innovation networks and their possible combination was part of chapter four.

### **5.1.3 Innovation in Networks and Communities Review**

The structural elements of innovation networks and communities of practice can be combined in order to improve and even maximise innovation performance. Innovation networks and communities of practice are distinct networking structures, but they have complementary

effects on learning and innovation, which can counter the negative consequences of each other. It was argued that organisations could take advantage of this complementarity in order to improve their innovation performance. The innovation process was explained by arguing that it concerns more than just the creation of novel ideas, but requires the implementation and diffusion of those ideas in practice. Three network concepts, namely strength and density of ties, cognitive distance and absorptive capacity was discussed in order to gain an in-depth understanding of networks from a learning and innovation perspective. These concepts were then related to innovation networks and communities of practice in order to explain their structures according to these three concepts resulting in two broadly opposing network structures. A combination of these three network concepts also result in a possible optimal network structure for each context. The possibility of improving innovation in every situation by establishing an optimal network structure was consequently discussed. The optimal network structure was found to be dependent on both exploration and exploitation. Innovation networks were shown to possess the appropriate structures for exploration to take place. Communities of practice on the other hand were also shown to be appropriate structures for exploitation, as well as the implementation and diffusion of knowledge also required for innovation to take place. Consequently, based on the structural requirements for exploration, exploitation, implementation and diffusion and the similarity between these structures and those of innovation networks and communities of practice, it was argued that a combination of the two might be able to maximise innovation. By combing the structural elements of innovation networks and communities of practice appropriately may allow organisations to create a network structure which is closer to the optimal innovation structure in order to maximise innovation in every context. The chapter concluded with a discussion on how innovation networks and communities of practice can possibly be combined theoretically, through boundary spanning and clustering, as well as practically.

## **5.2 Summary of Thesis Argument**

It was highlighted throughout the thesis that knowledge is the most important resource in today's global business economy as organisations require knowledge to innovate. The importance of innovation has steadily grown in the business world, rapidly replacing efficiency and quality as the main source of an organisation's competitive advantage. The sources of knowledge are widely distributed across organisational boundaries and society, forcing organisations to collaborate in order to gain access to all the required skills and knowledge to innovate and stay competitive in their markets. Resultantly, organisations need

inter-organisational networking structures in order to facilitate and support knowledge work and innovation. This thesis sets out to investigate the possibility of creating an optimal innovation structure in order to maximise innovation according to the specifications of every context. This was done by taking an in-depth look at two possible innovative organisational structures, namely innovation networks and communities of practice, organisations can utilise in order to facilitate and support knowledge work and innovation. After showcasing their strengths, weaknesses and structural elements, it was shown that even though they were structurally distinct, their roles in the innovation process are complementary and may even correct for one another. Resultantly, the possibility of combining the structural elements of innovation networks and communities of practice in order to create an optimal innovation structure, leading to improved innovation performance, was explored. I argue that combining the two structures may create the possibility of taking advantage of the strengths of both innovation networks and communities of practice, as well as marginalising their weaknesses as they may correct for one another.

The argument is based on the optimal network structure argument of Nooteboom and Gilsing (2004). They argue that each situation may have an optimal network structure which is best suited for the context. I argue for an optimal innovation structure in every context that may possibly lead to the optimisation of innovation performance. An optimal innovation structure, as in the case of an optimal network structure, is subject to a combination of several network concepts, namely strength and density of ties, cognitive distance and absorptive capacity. The correct mixture of these network concepts may determine the optimal innovation structure for each scenario as there is no such thing as a universally optimal innovation structure. It was shown that innovation networks possess the correct structural attributes, based on the three network concepts, in order to facilitate and support exploration, as well as allow the large-scale diffusion of information and knowledge. In the same sense, communities of practice are shown to possess the correct structural attributes for exploitation, as well as implementation and small-scale diffusion, to take place which are also required for successful innovation. Consequently, the argument is that combining the structural elements of innovation networks and communities of practice, based on the network concepts according to the context, may allow organisations to move closer to the optimal innovation structure of a particular context. These combined structures in every scenario may facilitate and support the processes of exploration, exploitation, implementation and diffusion of knowledge and innovation simultaneously, leading to improved innovation performance.

After it was shown why organisations need elements of innovation networks and communities of practice in order to improve innovation, the question becomes how actually one would combine these two structures. It is argued that management should strike a balance between these two structurally opposing mechanisms for promoting, facilitating and supporting the innovation process. On a theoretical level, it is believed that the concepts of boundary spanning and clustering are possible answers to this challenge, but they do not provide a complete solution individually. Rather, such elements must be combined in order to facilitate the combination of innovation networks and communities of practice in order to create an optimal innovation structure. The nature of optimal innovation networks, innovation networks and communities of practice requires organisational management to be flexible in practice. These structures exhibit different sensitivities to management which requires management to be more hand-off when trying to facilitate their creation and development. Subsequently, creating an optimal innovation structure, just as innovation networks and communities of practice individually in today's business environment, requires organisations to create an enabling context for them to thrive in.

### **5.3 Limitations of the thesis**

The validity of the argument in the thesis is dependent on the way innovation is perceived. For the purpose of the thesis innovation should be seen as a process consisting of several activities which are not linear, but rather recurring and intertwined. It is a very complex, uncertain and highly political activity, with many unpredictable outcomes along the way. More specifically, innovation must be seen as consisting of three highly complex, nonlinear activities. It involves the dynamic creation, diffusion and implementation of new ideas in different contexts (Newell et al., 2009:195). Resultantly, innovation requires not only the creation or discovery of novel ideas, but also requires implementation and diffusion of those new ideas. Thus, only focusing on innovation as the invention and discovery of novel ideas is consequently very partial (Newell et al., 2009:188). If a process perspective on innovation is not used when evaluating the legitimacy of this argument, the conclusions derived from this analysis will not be seen as accurate. This will lead to rejection of the assumption made throughout this thesis as well as the overarching conclusion reached as a result of taking a process perspective on innovation.

Secondly, the validity of my argument is based on the assumption that network concepts can be utilised in order to study communities of practice. Communities of practice are not

considered to be networks in their conventional way, but rather specific phenomena which manifest in most aspects of social life. However, it is assumed that a community of practice can be regarded as a special type of network, as communities of practice are also mechanisms which promote connectivity and exchange between different parties. Furthermore, Wenger (2010), one of the theorists which coined the term community of practice, also see them as networking structures in their most general and simplistic sense. Consequently, the assumption was made that network concepts can be applied on the concept of community of practice without much theoretical difficulty. Network concepts, such as strength and density of ties, cognitive distance, absorptive capacity and clustering were used in order to investigate the relevance of communities of practice in creating an improved or optimal innovation structure. Without using a common language, in this case the language of networks, to describe both innovation networks and communities of practice, it will be impossible to analysis and relate these two complementary innovative organisational structures. Whether network concepts should or can be applied on the concept of community of practice, will determine whether the proposals and conclusions derived by this thesis can be rejected.

#### **5.4 Implications for theory and practice**

Theoretically it has been shown in the thesis that innovation networks and communities of practice are often seen as competing alternatives in the innovation process, but we must rather see them as having complementary effects, correcting for one another. This is especially evident when one believes that innovation is not merely a linear process, but an episodic process involving also implementation and diffusion requiring the transformation of existing practices. In the end it would seem that innovation management require the dual focus on network and community formation, facilitation and support in order to improve innovation. Furthermore, in this thesis network terms and concepts have been used in order to investigate both innovation networks as well as communities of practice. The limitation of using a network language in order to investigate communities of practice has been illustrated in the previous section. Seeing that communities of practice are not normally regarded as networks, but rather competing structural alternatives, should we be using network vocabulary to discuss them? Or should we rather be incorporating the language of communities in order to discuss their role in the innovation process? Throughout this thesis, network terms such as strength and density of ties, cognitive distance and absorptive capacity have applied predominantly well to the structural elements of communities of practice. For



that reason, investigating communities of practice through utilising network terms have been sufficient in this specific case, but caution must be given for future research.

The proposal for the dual focus on network and community formation raises a practical question as to what extent management interventions in aid of the one structure are counter-productive for the other. This practical implication for organisational management has been raised in section 4.6.2.2, illustrating how the role of management should change in order to facilitate the development of both innovation networks and communities of practice. The nature of the knowledge management problem in search of an optimal structure revolves around the fact that communities of practice are essentially self-organising and sensitive to management interventions, whilst networks react more favourable to direct management. The challenge for management is to direct networks in order to gain access to knowledge not available in a particular organisation as well as diffuse that knowledge throughout the network, whilst at the same time enabling communities to develop in aid of proper exploitation, small-scale diffusion and implementation. This begs the question, how do organisations strike this balance structurally between innovation networks and communities of practice? Possible theoretical solutions to this question has been covered in section 4.6.2.1 and as we have seen there is no outright answer, rather the solution to lie somewhere between various possible solutions. Organisations will be required to find the appropriate balance between these possible facilitating mechanisms such as boundary spanning and clustering. The practical answer to this question is beyond the scope of this thesis, but poses a valuable opportunity for future research.

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