# Learning as a Social Process of Social Interaction in the Knowledge-Based Small Firm

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**Abstract**
The influence of globalisation, dynamic environments, the use and expansion of information systems and technology, has placed a huge influence on how the knowledge-based small firm uses and develops knowledge, (Leonard-Barton, 1995; Brown and Duguid, 1998). Such a focus on firm knowledge and knowing is particularly appropriate in the consideration of the demands which have been placed on the knowledge-based small firm to be innovative and creative, especially in competitive environments where the development and delivery of new services and products is of huge importance and represents an ongoing firm challenge. Dealing effectively with such challenges requires a focus away from the firm's knowledge base, which currently occupies much of the traditional discussion on organisational knowledge, and towards a focus which draws attention to organisational knowing as an emerging process from the continuous and situated practices of firm agents as they interact and engage with each other and the dynamic environments in which they function. By viewing organisational knowing as a process in which agents are understood to act knowingly as an element of their routines and day to day activities. A firm agent is viewed to be purposeful and spontaneous, continually and routinely reviewing the flow of their actions and of others, coupled to the social contexts in which their own activities are intertwined. As Giddens notes "such activities suggest an immense knowledge ability involved in the conduct of everyday life", (Giddens and Pierson, 1998, p.90).

The knowledge-based small firm constitutes a common interpretative of visions, values and experiences in the form of processes and routines which help to ensure how agents learn. However what an agent learns when sharing a common experience is not the same nor identical, and initial differences multiply over time. This gives way to the understanding that the process of knowledge creation and learning is supported by the development of distinct bodies of diverse firm knowledge. Knowledge in the small firms becomes distributed as an unavoidable consequence of the way by which it is produced; in which agents have varying perceptive, experiences, divergent insights and attitudes. As a result, the firm agents develop a variety of solutions as an intricate part of the ongoing process of learning by doing.

The growth of the social network discipline has been aided by various developments in the business world such as technology, and globalisation. Whereas the structure of the traditional industrial sectors is represented to a

large extent, by a resourced-based view and materiality – through products, machinery, processing systems, in the modern knowledge-based economy, in which we live, even if bureaucratic models of organisations still exist, the different ways of organising emerging are more fluid and dynamic than traditional structures. Networks have been viewed as a mechanism by which these two groups can develop and sustain relationships. These networks are viewed principally in functional terms as the channels through which knowledge is developed, placing huge emphasis on the practical value of the network itself. As a consequence there is very little data gathered in relation to the agents and relationships which are developed within the network and a lack of focus on its dynamics.

The paper will put forward the perspective that in order for the small firm to become a distributed evolving knowledge system, the promotion of social interactions amongst its components and agents is required. Whereas individual agents in the firm can individually create knowledge, the greater challenge is to promote social interaction amongst these agents which not only facilitates learning but also the creation of explicit and tacit knowledge, (Hansen and Haas 2001). The paper argues that creation of knowledge in the small knowledge-based firm is better accomplished through the interaction amongst individual agents with diverse knowledge sets rather than agents with similar knowledge domains. Thus the possibility of exchanging knowledge and through processes of reflection on existing firm knowledge in order to create new understanding is greater when agents involved have diverse understanding which is questioned. This perspective requires multidirectional interaction amongst agents of knowledge diversity, and high levels of connectivity and interdependence, enabling agents to become both sources and recipients of knowledge.

## Introduction

According to neo-classical economics the construction of a rational economic order is synonymous with attempting to find the optimum way or method which utilises the firm's resources. In this context the issue can be deduced to a mere issue of logic and mathematical calculation. Knowledge, in this case, is treated as merely an allocative device; firm behaviour is identified with the pattern of detectable actions the firm has undertaken in response to environmental change. Consistent with the neo-classical view, a behaviourist conception of individual agent behaviour is assumed to be identical with the pattern of measurable body movements in response to environmental stimuli. In which the firm's agents are considered to be fixed, bounded, and modelled entities, whose behaviour (response) is described by the systematic mechanical process of input-output regularities. Hayek (1989) argue that the economic problem of the knowledge-based small firm is not what orthodox economics has taken it to be, as firm knowledge can never be collected by a single mind. In other words rational economic calculation does not and cannot take into account the factual knowledge of particular circumstances of time and space, such knowledge is essentially dispersed in the firm, as propositional

type of knowledge *per se* cannot accommodate knowledge of local conditions of time and space.

Viewing the firm as a knowledge system places emphasises on understanding knowledge in a much broader sense than the propositional knowledge implied by the traditional perspective of neo-classical economics. In that the knowledge-based small firm's knowledge agents do not simply use existing knowledge, they also draw upon their own factual knowledge. Agents can be viewed as active producers of their surrounding reality, hence drawing emphasis on the interpretation process through which individuals attach meanings to themselves and their tasks. Drawing upon Polanyi's (1962) notion of tacit knowledge suggests that there are two forms of organisation knowledge, tacit and explicit. Knowledge and the process by which we understand and exchange knowledge in the knowledge-based small firm are often explored in regard to their ability to be managed. But if knowledge is considered as ambiguous, indefinite, and dynamic, as a phenomena of social knowing, which is related to meaning, understanding and process, and therefore difficult to manage, (Alvesson and Karreman, 2001), it would be more suggestive to think in terms of facilitating knowledge transfer and creation rather than managing the process. Thus by understanding organisational knowledge as an object/resource tends to favour explicit over tacit, knowledge processed by individuals over collective knowledge. It must be recognised that what an individual knowledge agent knows and the method in which this is practiced, emerges through the interplay between tacit and explicit elements of knowledge, suggesting the inter-subjective nature of knowledge, which is inherently indeterminate and continually emergent. From this context individual experiences are not considered in isolation, as knowledge is the product of emergent interaction and communication, (Tsoukas and Vladimirou, 2001). In order for experienced knowledge and explanations to have meaning, they need to be experienced, as meaningful and relevant by the social collective, thus acknowledging the existence of the social group which determine what is "memorable" and also how this would be practiced. This perspective moves away from the individual towards the group, from possessions to processes, placing focus on the emerging social interactions and practices. This suggests the complexity of knowledge, in the knowledge-based small firm, and draws attention to the fact that neither the individual knowledge agent nor the system in which collective knowledge exists, are allowed to prevail but rather that the examination can concentrate on the actions which manifest from the organisational practices displayed in the interactions between both, (Wenger, 2000). The firm's emphasises, in this case, would and should be more related to efforts of co-ordination and enabling, rather than managing, the varying knowledge processes occurring among different collectives and knowledge types, with and around the firm, (Newell, et al, 2001).

In order for the knowledge-based small firm to be understood as a knowledge system, the promotion of social interactions amongst its components and agents is required. Whereas individual agents in the firm can individually

create knowledge the greater challenge is to promote social interaction amongst these agents which not only facilitates knowledge transfer but also the creation of explicit and tacit knowledge. The creation of knowledge, it can be argued in the knowledge-based small firm is better accomplished through the interaction amongst individual agents with diverse knowledge sets rather than agents with similar knowledge domains. The paper will put forward the perspective that in order for the knowledge-based small firm to become a distributed evolving knowledge system, the promotion of social interactions amongst its components and agents is required. Whereas individual agents in the firm can individually create knowledge, the greater challenge is to promote social interaction amongst these agents which not only facilitates learning but also the creation of explicit and tacit knowledge, (Hansen and Haas 2001). The paper argues that creation of knowledge in the knowledge-based small firm is better accomplished through the interaction amongst individual agents with diverse knowledge sets rather than agents with similar knowledge domains. Thus the possibility of exchanging knowledge and through processes of reflection on existing firm knowledge in order to create new understanding is greater when agents involved have diverse understanding which is questioned. This perspective requires multidirectional interaction amongst agents of knowledge diversity, and high levels of connectivity and interdependence, enabling agents to become both sources and recipients of knowledge.

**Discussion**

In the knowledge-based small firm, knowledge is highly personal which includes such acts of integrity, and recognising the existence of both tacit and explicit elements of knowledge. Polanyi (1962) introduced the concept of tacit knowledge drawing importance to the significance to the personal element of knowledge – "into every act of knowing there enters a passionate contribution of the person knowing what is being known, and this co-efficient is no mere imperfection but a vital component of this knowledge". According to Tsoukas and Vladimirou (2001, p979) "knowledge is the individuals ability to draw distinctions within a collective domain of action, based on an appreciation of context or theory, or both". How a firm's knowledge agent draws distinctions is based upon how the agent perceives and process what they experience. Knowledge in this case is dynamically shared, in which agents actively share and integrate it with the firm's existing knowledge base. The perspective adopted is of "knowing in practice" - which focuses on knowledge not as a static, or given, manageable entity but rather as a series of social practices learned and re-learned. This view of firm knowledge leads us to understand knowing as emergent, (arising from everyday activities), embodied, (through past experiences, experiential learning and tacit knowing), and embedded (grounded in the constructs of the socio-historic context of employees, managers & researchers lives). This is recognised in the need for collective groups of agents to create common frameworks of routine practices and habits, but also to capitalise and encourage difference and variety which could allow for creativity and learning. It is through the interaction and relationships between the firm agents and their exchanges, that stories, experiences, and knowledge, are developed, maintained interpreted and transformed. This

position stresses the interactive and co-evolving nature of both the firm and the knowledge agents as well as the process of co-emergence of knowledge through the connection, interaction, relationships between diverse entities in the firm (Allen, 2002).

The knowledge-based small firm can be regarded as a network of interdependent units in which collective and individual agents are used in working teams as their building blocks. For this reason relationships among these interacting agents and differing components of the firm are complex, being characterised by a variant degree of co-operation and competition. This competition amongst the agent is been driven by power and scarce resource of the firm. But simultaneously these firm agents are dependent on each other in order to achieve their required tasks (Masterbroek, 1987). Because of the degree of interdependence among the agents, how these needs are regulated is a balance between co-operation and dependence on one hand and rivalry and autonomy on the other hand.

**Knowing and Social Networks**

What agents understand and know, coupled to the way they practice it emerges from the interplay between tacit and explicit knowledge forms, it is inter-subjective and is therefore inherently indeterminate and continually emerging. Further to this knowledge in this context is always historically and culturally specific, that is shared by particular social groups and sustained by social processes. Suggesting that this view of knowledge and how it is transferred requires a conceptual shift away from the individual towards the collective and from possessions towards processes, focusing towards methods of learning via interaction and social practice. This perspective emphasises how connections among members of a network can enable learning and knowledge sharing. These connections established among different members of the network allow not only for knowledge transmission among collectives but also open up the possibility of learning and sharing new meanings. If we think in terms of organisational collectives and their working relationships this also means that agents are able to organise themselves and the knowledge they share by relying in their web of connections when they need to search and acquire new knowledge or reorganise their activities. The benefit of this perspective is the conceptualisation of the organisation as a structure that is fluid but sensitive to the needs of the connected elements as well as in connections with its environment in such a way that co-evolution of both the organisation and it environment is possible.

The contribution of the firm's social network, to the creation of firm knowledge and learning, enables firm agents with access to a range of diverse experiences and knowledge (McQuaid, 1996). These firm networks are not restricted by organisational boundaries but rather emerge out of the multi-interactions that the firm agent have or occur. Studies of knowledge processes in organisational literature have focused on invention and distribution of physical systems (ICT) in organisations and management. The image of a firm as a machine, when considering knowledge as dynamic, is now problematic. As the machine image of the firm relies on the deployment of rules and control

mechanisms in order to simplify firm processes, in order to achieve a predictable, stable, rational based firm as the means to understand the process and the inter change of knowledge. The roles of social networks have been looked at in a variety of differing ways. The studies conducted have emphasised the importance of the structural features of network relations and organisational context surrounding the formation and emergence of those networks. This is further underpinned by the view that knowledge is a relatively stable entity that is transferred in a static form through network configurations to promote learning and transfer. Even though it is now recognised that the business environment is constantly changing, the above metaphor for understanding knowledge strategy and the firm as a machine still dominates the way in which knowledge is viewed and understood as a co-ordinated strategy in the firm.

A consequence of this view, is that, there is little understanding or data in regard to the agents and their relationships within the social network, and a lack of focus on its dynamics (Burt *et al.,* 1983). What is absent from the current literature is the understanding and acknowledgement of both the processes of learning and knowledge exchange as being related to social action. It is this perspective, and the self directed perspective of networks, coupled to the uniqueness of the relationships developed which helps to differentiate and develop knowledge in the firm. While networking is viewed as an important requirement in enterprise these learning opportunities are argued to be of particular importance to the knowledge-based small firm in order to offset the fragility of size. The development of knowledge is seldom a readily visible process in the knowledge-based small firm as it often arises accidentally out of social exchanges of diverse knowledge, an important factor is the quality of relationships which exist in the knowledge-based small firm's network and how these networks are used, in terms of how agents and managers learn from these relationships. Current knowledge techniques are formal models created through archetypes of social learning which are in themselves simplified reductionist based explanation of what are essentially complex processes and fail to address and understand the process of transferring and creating firm knowledge. The transfer and creation of knowledge is essentially a deeply social process which must take into account human and social factors.

Wilson and Lupton (1959) recognised that knowledge has an informal social dynamic which allows the subject to emerge, not individually or singularly but rather always entangled with and generously influenced by a collective (Gomart and Hennion, 1999). The assumptions with regard to independent and isolated firms competing in an impersonal marketplace is increasingly inadequate in a world in which the knowledge-based small firm is embedded in networks of social, professional and exchange relationships with other agents (Gulati, 1998). The term network is not been used to represent a definable spatial entity which is made up of a finite, identifiable set of firm agents. But rather the network is viewed as indeterminate unique to each individual and collective, and can in principle expand indefinitely.

An integral part of the learning process is in the complex network of relations which exist in the knowledge-based small firm. Nohria (1992) states that while typically the term network is used to describe observation it is just as likely to be used normatively to advocate what organisations or indeed knowledge-based small firms must do within today's competitive business environment, as it is from these networks of relationships that learning and influence emerges as part of an ongoing negotiated process of diverse knowledge. This suggests that learning process has a social dimension in which agents are constantly, (through interactions with and influence of other agents in the network), making sense of their environments through flows of activities which other agents are involved, in order to make decisions by generating new knowledge, it is this ongoing process that sets the stage, within which the knowledge-based small firm's agents learn. Learning can be located in the process of co-participation and inter-subjectivity (Thorpe 1990, Lave and Wenger, 1991) highlighting the fact that learning theories fail to account adequately for the wider context in which learning takes place. The social process always mediates "what is known" and "how it is known", suggesting that learning can be considered as a process of argumentation in which reflecting, theorising, experiencing and action are viewed as different aspects of the same process, (Pavlica *et al*, 1998).

**Organisational Learning**

Critical to knowledge networks is the conceptualisation of organisational learning and organisational theories as processes of knowledge creating entities which have focused on how complex unstructured problems are solved and elements of context and degrees of contextualisation are considered central elements in the task of the knowledge-based small firm. By viewing the knowledge-based small firm as a social network, these networks and the relationships held within, are evolving among the agents and can be recognised through patterns according to content, form and energy, content referring to the information or service, form relating to the closeness, proximity, duration of the relationship between agents and finally energy considers the frequency of that interaction. This can be further developed in that the relationship between network agents can be understood as deriving from the agent's autonomy and mutual dependence, the co-existence of both agents and the degree of their connectivity which are in constant competition for the network resources, which are coupled to redundancy and stability of the network. The boundaries of the network are thus difficult to determine as they co-evolve and form through the interactions of the agents in the network, thus the boundaries are fluid allowing the network to self-organise. The focus then moves from the control and audit of the network's boundaries to the development and understanding of the social interaction which take place in and outside the network. Consequently the knowledge-based small firm's knowledge absorptive capacity lies in the evolving patterns of relationships between its agents and is destroyed when these relational patterns are destroyed, (Stacey, 2001).

The degree to which knowledge is developed and utilised in the knowledge-based small firm results from the interdependent influences of the agents and firm processes, (Schaef and Fassel, 1988; Shapira, 1997 and Turner, 2001), individual limitations, (Kleket *et al*, 2001; Kolb, 1984; Baum and Ingram, 1998) and the emergent opportunities that arise through the firm structure. The knowledge-based small firm contains both, rules, norms and routines but also dynamic elements, social relationships, that routinely influence the degree to which knowledge is created and utilised. Literature domains have established that the development of firm networks means developing a common language a set of working experiences amongst firm agents, (Argate and Ingram, 2000; McElroy, 2000). It is the balance or edge of chaos between creativity, diversity, rules and procedures designed to enable uncertainties that influence the extent to which firms may learn, (Delahage, 2001). The knowledge-based small firm does not learn *per se*, but rather learning occurs within those who are members or agents of the firm. Accordingly while network theories recognise firm's structure and social relationships the traditional functionalists view fails to identify adequately the methods in which individual agents and collectives can negotiate their way through these networks in order to harness and utilise knowledge.

While network theories draw recognition to the complexities of social knowledge and knowing, the methods in which knowledge is utilised within firm agents is largely understood through models that pre-suppose rational linear processes of knowledge management. However agents in the knowledge-based small firm and the nature of their learning infrequently fit this process. Knowledge creation in these networks is rarely developed through individual agent acting alone, rather knowledge and knowing results through groups of individuals sharing experiences and knowledge in the pursuit to a common goal, which is subject to emergent influences, (McElroy, 2000). To develop an understanding of the methods in which groups learn it is critical to appreciate the processes by which individuals acquire knowledge, as group learning cannot occur if the individual does not engage in the learning process. While there are numerous variations to the definition of knowledge and what constitutes organisational knowledge, knowledge in this instance can be described as information that is instilled within individual and collectives which has relevance and meaning. Learning in the knowledge-based small firm has been described in terms of the varying skills which are required in order to effectively draw in new information and attribute meaning and context, (Sveiby, 1997). This suggests that the creation of knowledge involves both procedural and contextual elements; procedural knowledge involves the process knowing how to take data and develop this into information, contextual knowledge bears attention to the environmental domains and awareness of the agent of their influence on the environment and the issues which arise from it. In this regard connectionist or cognitive network theories can provide a useful platform from which to understand the creation of organisational knowledge. Knowledge can be understood as a collection of networks consisting of elementary or neuron (agent) type entities containing diverse sets of knowledge.

The firm's agents (neurons) are connected through degrees of inter-dependence, in which a single agent has many links to other agents in the firm. Each agent can transmit and communicate with other agents, learning occurs by associating, sharing and exchanging experiences with various agents of diverse knowledge. It is through these patterns of interaction which emerge in the network that knowing is developed with meaning and context. Knowing in the knowledge-based small firm is a process in which agents in a network are continuously self-regulating and restructuring from existing forms. These social networks are capable of dynamically interacting with each other while simultaneously operating with the agent's personal experience, cognitive ability and dependence to engage in process of interaction. The fact that terms such as group learning, organisational learning and knowledge management have become familiar in academic and practitioner domains from prompting learning contradicts the understanding that the process by which knowledge is created and disseminated remains poorly understood (Brief and Walsh, 1999). A reason for this is that most of the current models in existence fail to take account of the dynamic complex processes of social interaction, (Argote *et al*., 2001).

The perspective on learning and knowledge in the business environment leads to a conceptualisation of organisations that stresses their inherent complexity and their interactive and co-evolving nature with their environments. Complexity science provides a new perspective from which to consider the sharing and developing of organisational knowledge, complexity views organisations as dynamical systems, which are adaptive because they are made up of agents who experiment, explore, learn and adapt to changes in their environments. Complex adaptively can be described as an evolutionary response to the survival needs of the system, agents as individual complex adaptive systems are adept at self-organising, at learning from their experiences, and their ability to learn and create knowledge is underpinned by self-organising behaviours for exploration of knowledge. When complexity is taken in the context of social science very little research or application of such theory has been developed in regard to social networks which are located in the small business firm. By viewing the nature of a knowledge-based small firm as the organising activities of independent agents, it leads to a particular perspective on how learning occurs because of the non-linear interactive nature of social interaction. Learning is thus understood as emerging shifts in patterns of human meaning.

In complex situations and conditions many supporters of organisational learning, promote Kolb's learning cycle suggesting that learning is a dialectic and cyclical process consisting of four action and reflection stages. In practice, this cycle of action and reflection activity does not follow a linear and sequential fashion. But rather, it is a far more fluid and dynamic, in which learners move back and fourth among the stages. Learning is the activity of independent agents and can only be understood in terms of self-organising social interaction, individual agents cannot learn in isolation and organisations can never learn, in totality. In contrast, the traditional approaches to learning

makes the assumption that knowledge must be transmitted and received in the form of explicit information, after which learners can apply this new found knowledge to their won purposes, in this case learning is viewed as an external objective process. Firm learning needs to recognise the tameness of agents, to generate and transfer knowledge rather than merely absorbed passively the results of research. This form of learning, through processes of social interaction is both individual and collective, by providing a flexible and systematic approach to conceptualising and transferring learning from experiences. Knowledge and learning are therefore emergent properties which are difficult to manage, organisational networks of knowledge are seen as the best way to encourage agents to participate and learn. In that, learning cannot be separated from work and the learning which takes place as agents engage in everyday social life. It is through the connection among the agents of a network and their interactions that new stories, experiences and knowledge are shared and developed. Form this perspective the concept of knowledge in the knowledge-based small firm must be focused towards both the interactive and co-evolving nature of organisations and their environment in which these firms function the social process of co-emerging knowledge, and relationships through the constant connection, interaction between diverse members of the social network in and across the firm.

**Conclusion**

The creation of knowledge requires multidirectional interaction, self-organisation among agents with diverse knowledge forms, enabling them to become both sources and recipients of learning (knowledge). This multidirectional interaction maybe facilitated by the development of a learning environment in which the firm agents participate, as it is not only the transfer of knowledge (explicit) that is involved but also that of tacit knowledge, which can only be acquired through the process of interaction, (Nonaka & Takeuchi, 1995). Interaction among varying agents with differing knowledge forms which are shared and transferred in order to create knowledge have two critical focal points, firstly the willingness of the agents, located in different parts of the firm to share their knowledge and understanding, secondly knowledge agents with different knowledge need to be able to understand each other, in that they require a common language, (Arrow, 1974) or a common tacit knowledge of the firm and its environment, (Grant, 1996). Knowledge in the knowledge-based small firm is typically developed within a network of agents, specific to a context at a certain moment and time. This entails attributes of a particular approach to the study of organisational knowing and learning which sees them as a from of social expertise, a collective knowing developed and learned in action and interaction in very specific, historical, social and cultural contexts, (Nicolini, Gherardi, and Yanow, 2003). Conceptualisaing a view which challenges the perspective of knowledge in the knowledge-based small firm as a noun, as an objective product of mental processes that can be detached from the minds of the knowledge-based small firm’s agents which can be traded or sold. Rather than viewing knowledge as a firm resource which is objectified and commodified it may be more insightful for understanding to treat such a

processes as "learning in practice" and to explore whether the character of practice based knowing varies from one network to another, (Orr, 1992).

Local knowledge is contextual knowledge, knowledge that develops in interaction among agents and develops out of experience and much of it is tacitly known – "a kind of non-verbal knowing that evolves from seeing and interacting with an agent over time (Hafner, 1999). The local firm agent is far more knowledgeable about the task at hand than those without such experience, expertise which is embedded in local knowledge in intimate familiarity with and understanding of the particulars of the local situation. As Greenwood and Lewin (1998) note local knowledge is complex, highly differentiated and dynamic. In other words local firm knowledge is situational but this does not mean that the localised knowledge is lacking in expertise or divergences  rather it is the character of expertise which is different this local knowledge legitimates the experimental contextual as a type of specialisation equal in value. The demand for new knowledge is frequently mentioned as a major reason for the emergence and recognition of social networks, and how these networks can be used to support activities and knowledge flows in the process of knowledge creation and learning through working practice. This draws focus on knowledge as a social action and networking as an organisational practice. In order to address the challenges of the knowledge economy, the knowledge-based small firm needs to continuously develop new working practice and knowledge which shape and are reshaped by the manner in which firm agents relate to each other both within and across the firms social network.

Human knowledge agents live simultaneously in two co-evolving, yet very different worlds. The first world is the external world of people, things and events where the knowledge agents participate in the life around them. This external world is always beyond the knowledge agent's ability to perceive in totality. Complexity suggests that this external world is so woven through with multiple causes and complex feedback loops that the human mind cannot fully comprehend it. Bohm (1980) suggests that the external world the "implicate order" is so rich that we can only perceive selected elements of it the "explicate order". As a result the knowledge agent lives and functions in a second world, the internal world which the agent's minds create order to understand the external world. There two worlds are deeply interconnected, in which the details of any knowledge agents perceptual world are selectively taken from the external world. Like other living entities the knowledge agents perceptions filter out significant amounts of information "skewed towards the features of the world which matter", most of the survival of the knowledge agent and the knowledge required. The interaction of this created world picture with the external world forms a powerful feedback loop. The process with which knowledge agents most often organise the external world is through knowledge gained by the use of narratives and experiences or tacit understanding. These narratives or alternatively descriptions of the external world, as Bateson (1979) notes "a little knot of relevance providing the context with which the knowledge agent can create meaning, drawing on their patterns

and sequences of experiences". Thus Kauffmann's descriptions are "how we tell ourselves what happened and its significance". To achieve this knowledge agent must choose, order and sequence knowledge in order to indicate cause and affect relationships. The use of descriptions enables agents to reduce the external world to a form of emerged comprehenability. For Cohen (2003) this ability to create different meanings from the same reality is a central quality of all complex systems. In that meanings emerge or are a construct for the description and how that description is constructed.

Knowledge can be regarded as a product of the self-reinforcing feedback loop by which human beings connect their internal perceptual worlds with the external world. In that each agent generates knowledge as they test images of their internal worlds in the external world. Knowing in this context is developed as agents interact with the external world as well as each other. In such interactions agents respond to an unconscious level, and if they respond or feedback creates the desired results, they will repeat that response in similar situations. This new knowledge gained is then translated though interactions in order that each agent is consciously able to explain what may have happened. Boge (2001) notes that "agents live in the anti-narrative", in other words, each agents experience of knowledge is the ongoing experience which they accumulated in order to explain what is happening around them. Once an agent has created a meaning to explain an event, the agent well act on the basis of that meaning, the agent will act out on the basis of that meaning, most often without being conscious of the process. If this meaning fails to enable the agent to produce the desired rationale, the agent will create anew or more accurate meaning to aid understanding of the context. When this does not occur the agent will continue to enact that meaning in their actions. With time and continuous context the meaning can become mythic and begin to signify, not what happened, but they ways things are, as a representation of the agent's reality. The need that derives the knowledge agent to seek knowledge and meaning to help other agents discover the actions they must take in order to survive. In other words new knowledge and meaning enable agents to transform information, Bateson's (1979) "difference that makes a difference"; into the knowledge the agents need to survive in their continually changing world.

In this perspective what any agent knows about any information depends largely on the meanings and language through that knowing is processed. Baskan (2003) notes that understanding and knowledge begins in the context of the firm, representing a model of social interaction, in which the firm agents experience the firm and its knowledge requirements. Some important issues of this are firstly the firm can be viewed as the vehicle by which firm agents absorb cultural-specific meanings and knowledge. Secondly agents, through gaining knowledge and new meaning, adopt behaviour patterns as they interact with each other agents thus constructing new meaning in order to explain the habitual behaviour patterns. In this context an organisation which has the ability to create and transfer knowledge on an ongoing basis has

developed a dynamic and unique capability that potentially underpins continuous organisational learning.

Taking the view of knowledge and learning as a dynamic process of social interaction, by drawing upon complexity theory as a paradigm of understanding towards these social processes of knowledge strategy and learning the social system is perceived as dynamic, complex, self organising and adaptive. Knowledge and learning are therefore emergent properties which are difficult to manage in organisational networks and communities of knowledge are seen as the best way to encourage agents to participate and learn. In this context learning cannot be separated from the work and learning which takes place as agents engage in everyday social life. As Fuller (2002) states "although the existence of these nimble networks enabled the business community to adapt to a changing competitive environment, the only knowledge traces they have are those embodied in their constitutive nodes and joint products. But once a network's mission is accomplished its human nodes simply disperse and connect with other nodes to form new networks in pursuit of new projects. What this suggests is that as change becomes more frequent in human social systems, through learning.

In spite of the wider understanding and recognition of the complex dynamics which are found within a knowledge-based small firm's knowledge network there is the continued search for understanding these dynamics. If the knowledge-based small firm's knowledge is to drive innovation and learning it is important that an understanding of the processes underlying the creation of knowledge and the epistemological domain of knowing, but also the relationships and dynamics within this process. Social scientists have sought to describe and explain the use of knowledge in the subject domain of organisational theory and knowledge management and have developed a substantial body of research on the influence of social factors on the creation of knowledge such as the acquisition, dissemination and utilisation of knowledge (Paisley, 1993). Cognitive psychologists have produced numerous theories attempting to understand the processes and mechanisms of the cognitive methods underlying the creation and use of knowledge. Social cognitive theorists look to integrate social and psychological methods with a view to conceptually mapping the cognitive methods which underlie social interaction. What these theories do acknowledge is the complex interplay of social factors and knowledge-based small firm structure and the relationships between them, (Leydesdorff, 2001).

Research in this area has rarely addressed the role played by networking activities and knowledge flows in the process of knowledge creating and knowledge strategy working practices. In order for social networks to aid knowledge strategy and learning a methodological framework needs to be established in order to develop a more generative interplay between social networking practices, learning and knowledge sharing. The growth of the social network discipline has been aided by various developments in the business world such as technology, and globalisation. Whereas the structure of the traditional industrial sectors is represented to a large extend by a resourced-

based view and materiality – through products, machinery, processing systems. In the modern knowledge based economy, in which we live, even if bureaucratic models of organisations still exist, the different ways of organising emerging are more fluid and dynamic than traditional structures. In the domains of the business practitioners and social researcher's, networks have been viewed as a mechanism by which these two groups can develop and sustain relationships. These networks are view principally in functional terms as the channels through which knowledge is transferred, placing huge emphasis on the practical value of the network itself. As a consequence there is very little data gathered in relation to the agents and relationships which are developed within the network and a lack of focus on its dynamics. What is missing from previous analysis and studies on this issue has been the understanding of both processes of learning and knowledge strategy as always been related to social action.

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