DEVELOPING BUSINESS-TO-BUSINESS KNOWLEDGE CREATING PROCESSES

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INTRODUCTION

Business-to-business networks are complex dynamic environments alive with processes of continuous change. Research about how firms can account for dynamic change and use this to obtain a sustainable competitive advantage is limited and confused. In addition there is little by way of research aimed at understanding how dyadic relationships and in turn networked organisations account strategically for dynamic change. In addition previous work toward understanding what leads to a sustainable competitive advantage looked at organisational 'core competencies' (Prahalad & Hamel, 1990) which arguably took a resourced based view of activities within a 'the firm' as an organisational level. Subsequent research focused on 'capabilities' (Stalk, Evans, & Shulman, 1992) and in turn 'dynamic capabilities' (Zollo & Winter, 2002) shifting the focus of inquiry toward processes. By extension a focus on processes would naturally lead us to consider inter-organisational processes as a natural context for the study of dynamic change. IMP researchers have always taken a healthy interest in conceptual and methodological developments relating to key concepts, such as interaction (Håkansson and Ford, 2002; Ford and Håkansson, 2006), business context (Håkansson and Snehota, 1989) and network horizons (Holmen and Pedersen, 2003) which all imply a dynamic setting in which units of analysis exhibit a durable quality, but with that durability being tested continually by variations in the stability in the composition of those units of analysis. Håkansson and Snehota (1995) address, conceptually, how researchers can incorporate the IMP's Actor Resource Activity (ARA) model at different scales and among different units of analysis by picturing it in an organization, in dyads and triads of organizations, in nets of small numbers of organizations, and indeed in networks. To date, a dominant trend among IMP researchers is to work at one of these levels and units of analysis, identifying phenomena specific to those 'other' levels as matters of context, and perhaps matters beyond a context's horizon. The crucial question here is what inter-organisational capabilities, which are dynamic in nature, are desirable and represent a clear line of inquiry and focus for research? Many fields and disciplines contribute to this question in their own way. Research has focused on economic processes of absorbing knowledge spillovers (Cockburn & Henderson, 1998; Cohen & Levinthal, 1990; Easterby-Smith, Graca, Antonacopoulou, & Ferdinand, 2008), how organisations learn (Argyris & Schön, 1978) and by extension the learning organisation (Senge, 1990) and whether knowledge itself can be the basis of competitive advantage (Malhotra, 2003)? IMP researchers has tended not to focus attention on how knowledge within business-to-business relationship can influence the interaction approach. This paper, with its interdisciplinary perspective borrows from many fields to highlight how concepts can contribute to the body of work in the industrial marketing and purchasing field.

The developing field of knowledge management recognises that an organisation's knowledge or the knowledge of its employees is a key resource that should and could be managed. This was primarily discussed under the resource based view of the firm. Knowledge management (KM) as a field has predominantly emphasised the capability of completing successful knowledge transfer and the transfer of existing knowledge. Knowledge management (KM) has also focused on technical solutions of knowledge capture and dissemination; these solutions to managing knowledge heavily relying on information systems and information technology. The underlying assumptions were that the KM cycle can indeed be managed; can be created, moulded, captured and disseminated, through a form of direct intervention by

management. Knowledge was thus understood as being explicit in nature. Arguably knowledge transfer was a linear event involving explicit knowledge as opposed to a process involving tacit knowledge as can be seen in more recent research. Traditional KM textbooks (Awad & Ghaziri, 2004; Hislop, 2004) tend to follow a uni-directional traditional process from creation through to knowledge capture, transfer and dissemination. Additional perspectives consider acquisition, storage and usage which appear to assume that knowledge is pre-existing and explicit. Through its management a sustainable competitive advantage can be realised. This tendency to describe things in a linear fashion might have its origins in the information processing paradigm (Simon, 1973) and the behaviourist approach to inputs and outputs in systems (Von Bertalanffy, 1972). This linear way of describing stages has been reinforced by studies involving the diffusion of innovations, technology management and theories of entrepreneurship which also facilitate research on 'knowledge transfer'. If inputs are improved and the stages toward the outputs are enhanced, and managed, then the activities of KM will be successful either as a core competence or a capability. KM has more recently begun to tackle the assumption that knowledge pre-exists in neat packages transferred in discrete events. A shifting focus toward tacit knowledge has aided an epistemological shift favouring dynamic capabilities underpinning processes. So in the context of KM as an evolving field how can it inform our search for dynamic capabilities? While much of the research focus within the KM Cycle centres around knowledge transfer little is known about 'knowledge creation'. Being informed by a process view of the world knowledge creation is not just a stage or event but it too is a process and an under researched process at that. In the context of looking at continuous change within dynamic business environments so as to uncover some form of dynamic capabilities the KM cycle, if perceived as a dynamic process provides fertile ground for future research. Doing so in the inter-organisational context would be of particular interest to IMP researchers.

The research focus on knowledge creation is a relatively new focus being previously subsumed and supplanted by a research agenda on knowledge transfer. The focus on knowledge creation gained much attention following the publication of 'The Knowledge Creating Company' by Ikujiro Nonaka and Hirotaka Takeuchi in 1995. The authors focused on a broader theory of knowledge creation, beyond creation being just one stage in the KM cycle also known as the asset model process. This involved detailed processes of knowledge conversion constituting knowledge creation. This book was the product of a stream of publications (Nonaka, 1991) with a basic discussion about the concept of a knowledge creating company underpinned by a resource based view of the firm and a 1994 article on the dynamic theory of knowledge creation (Nonaka, 1994). The dynamic theory of knowledge creation was further developed with the introduction to the concept of 'ba', or 'space' for knowledge creation to occur (Nonaka & Konno, 1998; Nonaka, Toyama, & Konno, 2000), and further books to develop the theoretical direction with empirical research into enablers of knowledge creation (Nonaka & Nishiguchi, 2001; Nonaka & Teece, 2001; von Krogh, Ichijo, & Nonaka, 2000; von Krogh, Nonaka, & Nishiguchi, 2000). This stream of publications is important as it highlights the origins of the focus on 'knowledge creation' as an organisational capability. However there is still much debate surrounding the approach taken within this research. As a preliminary criticism as noted above, knowledge creation is treated as a linear process from creation to dissemination in the asset school of KM. In the dynamic theory of knowledge creation (Nonaka, 1994; Nonaka & Takeuchi, 1995), knowledge creation is discussed in the context of 'knowledge conversion'; through the relationship of tacit and explicit knowledge. This is dangerously close to KM looking to 'knowledge transfer' as the cornerstone of research into knowledge creation. One might argue that Nonaka et al's 'dynamic theory of knowledge creation' is really a rehashed version of the

theories of knowledge transfer or knowledge transfer in sheep's clothing (Kaufmann & Runco, 2009). The dynamic nature of this theory is also questionable as it is couched in theories derived from a static view of the world. Nonaka (1994) alludes to this argument in reference to the static and passive nature of the prevailing view of the organisation. The prevailing paradigm also visualises the firm 'as a system that 'processes' information or 'solves' problems. Central to this is how efficiently the firm can deal with information and decision making in an uncertain environment. Nonaka proposes that the new theory engages with a dynamic nature of the world saying that the organisation should be studied from a view point *'of how it creates information and knowledge, rather than with regard to how it processes these entities*' (p15). In conclusion of this argument, as we seek out potential sources of organisational capabilities Nonaka & Takeuchi (1995) note that '*knowledge creation by the business organisation has been virtually neglected by management studies'* (1995 p xiii). They continue by suggesting that their core concern relating to the new theories of management relating to knowledge is that *'at the core of concern of these theories is the acquisition, accumulation, and utilisation of existing knowledge; they lack the perspective of 'creating new knowledge'* (1995 p49).

Because we are looking into 'knowledge creation' it is important to reiterate two key a priori assumptions that are being made as to what this involves and entails. Firstly, knowledge creation is assumed to involved change or 'dynamic change' leading to action. This builds on the discussion above about moving from 'core competencies' to 'capabilities' to 'dynamic capabilities' and is informed by the Burrell & Morgan (1979) discussion regarding 'static' to 'dynamic' sociology. Change is different to institutionalised process thus this discussion and assumption impacts on how the context is approached and selected. On a macro level the business environment is assumed to be 'dynamic' in nature so this is of more interest. Knowledge creation is thus assumed to occur in a context of action building on this assumption of change. On a micro level both human and non human actors are seen as agents of action and it is within this action that change occurs within processes. Therefore it is important that we seek out process of change underpinned by action and utilise appropriate theories that can cater to this assumption. Thus we're focusing in on 'open systems' as opposed to closed systems. Secondly, knowledge creation is assumed to be a process rather than a structure. Thus to understand 'knowledge creation' we must then seek out processes rather than events. An event is of interest insofar as how it influences the open system. Focusing on processes of knowledge creation is assumed to yield a better understanding than might be revealed by looking for static events. Compounding the lack of research in this area within a single organisation there is significantly less focus on processes of inter-organisational knowledge creation. For this reason this paper is concerned with inter-organisational processes, in dynamic environments, illustrating processes of knowledge creation. By appreciating this we can gain a better understanding of how developing and managing processes of knowledge creation in networked organisations, and in market-as-networks, can lead to a sustainable competitive advantage.

THE CONTEXT

Following on from the a priori assumptions about knowledge creation, a processual inter-organisational context might provide a context for appropriate insights into process of knowledge creation. Therefore dyadic interactions or networks of organisations should provide a rich context informed by the interaction model which provides an insight into the processes that connect organisations. Within this conceptual framework a number of inter-organisational contexts were considered. There are many contexts that reflect business-to-

business interactions relating to knowledge creation. One such thread of research is from the industry/research policy literature which provides a key insight itself in the evolving nature of knowledge production in society. Gibbons et al (1994) introduces and elucidates a theory of knowledge production on a societal level that reveals much about or educational system, how research is conducted in society and how government and employers interact so as to produce knowledge in society. Gibbons et al discuss how a modal form of knowledge production has been arrived at. For future knowledge to be produced there must be an interdependent relationship between employers and academic institutions. Mode 2 knowledge production has a number of characteristics but it is underpinned by dyadic and networked organisations interacting to produce knowledge.

Questions have been asked about the role of universities and specifically the agenda of business schools (Huff, 2000; Huff & Huff, 2001). Interestingly these questions have been framed in the context of how business schools through interacting with other organisations can become more relevant and interdependent. The theory-practice divide has come into focus and attempts to narrow this divide have been broadly seen as a way for continued innovation and creativity. With the calls for researching knowledge creation in a modal context (Gibbons et al., 1994; Huff & Huff, 2001; Nowotny, Scott, & Gibbons, 2001) and spanning a theory-practice divide (Van de Ven, 2007; Van De Ven & E., 2006) through engagement the rationale behind considering the university-industry context is thus appropriate. The core of Gibbons et al's (1994 p.13) thesis is *'that the parallel expansion in the number of potential knowledge producers on the supply side and the expansion of the requirement of specialist knowledge on the demand side are creating the condition for the emergence of the new mode of knowledge production'*. Therefore it makes sense to try and get a supply side and a consumption side of the process that connect organisations in the market. For this reason studying a traditional dyad i.e. the producer (university) and consumer (commercial organisation) would provide a rich picture of the knowledge creating processes. Therefore this study considers the theory-practice divide as a fruitful context for studying knowledge creation in an organisational setting.

The university-industry context has been researched from many different perspectives most notably from an economic one. Research into patents (Agrawal & Henderson, 2002), the absorptive capacity of firms to take advantage of knowledge spillovers from universities (Cockburn & Henderson, 1998) and research into the success of incubation centres all reflects innovative benefits. Within this environment many different linkages and connections can be were considered. However for ease of access and ensuring data could be collected from beginning to end, a complete routine could be accessed and observed an Internship/Placement context, connecting employers with the university, was adopted for this study. Internships/placements are where students through the process of placement spend up to 9 months with an employer. They then return from a 'practice' based environment to a 'theory' based environment to complete their studies. Academic institutional actors (circa 16 actors), employer actors (circa 56 organisations) and student actors (circa 130 interns) who cross the theory-practice divide under the period of study represent the context for this case study.

LITERATURE REVIEW

Introduction to Knowledge Creation: An Inter-Organisational Dimension

According to Nonaka (1994) '*although a great deal has been written about the importance of knowledge in management, relatively little attention has been paid to how knowledge is created and how the knowledge creation process can be managed'* (p16). Grover & Davenport (2001) discussing perspectives on knowledge management noted that *'very little research has emphasised knowledge generation and realisation processes or the role of*

strategy and its relationship with knowledge processes' (p13). Interestingly these statements provide the rationale for studying processes of knowledge creation, but it narrowly implies that this should be done within a single organisation reflecting the predominant levels of analysis within the field of knowledge management. Later in the article Nonaka (1994) acknowledges the need to look at knowledge creation from an inter-organisational perspective reflecting a shift in the level of analysis stating; *'In addition to the creation of knowledge within an organisation, it is also possible that there will be formal provisions to build knowledge at an inter-organisational level. This might occur if informal communities of interaction, that span the link between customers, suppliers, distributors, and even competitors, are put on a more formal basis, for example, through the formation of alliances or outsourcing'* (p17). The implications of this are not just that knowledge creation should become a focus of study but it should also be considered in a dyadic and/or network context. Not only should research efforts be directed into this the above statements provide a rationale for an inter-organisational dimension. A more detailed discussion on theories of knowledge creation will be dealt with later in this paper.

Processes of Knowledge Creation

If we are sincere about researching 'knowledge creation' in an inter-organisational setting it would be clear that processes of knowledge creation should be a starting point. Rather than considering creation as an instant event, or the idea that creation is something from nothing referred to as *'creatio ex nihilo'* causes difficulties from an ontological and epistemological perspective. Identifying knowledge that has been created from nothing and devising appropriate methods to capture this event of knowledge creation still evades researchers. One helpful perspective is to focus on what creation means within a practice based context (Van de Ven, 2007) as opposed to an idealised academic context. The concern here is that this research is based on finding true knowledge creation or creation that clearly shows 'something from nothing'. Research of this specify is erratic, potentially requiring longitudinal and highly fine tuned data collection that requires extremes in serendipity under experimental conditions. Whereas the discussion around *'creatio ex nihilio'* can be seen as a epistemological discussion. The practicalities linked to application focuses research around asking what are the processes or generative mechanisms (Tsoukas, 2009; 2004) associated with knowledge creation. This research is focused on identifying likely processes of knowledge creation rather than events. This research might be more in the area of gradual incremental and material change rather than in the realm of major paradigm shifts and the destruction and recreation of new paradigms (Kuhn, 1962). The study of knowledge creation as a construct has been broadly neglected, especially within the field of knowledge management which considers the KM cycle. As noted above its focus is very much on the other stages of the cycle including gathering, storage and transfer and dissemination. Whereas logically 'creation' is the first and most important part of this cycle due to disciplinary constraints the knowledge management field has tended to focus more on the more measurable aspects of the KM cycle. Secondly those who do focus on 'creation' within the knowledge management cycle tend to have varied approaches to what is deemed to be 'creation'. There is little agreement on what 'creation' means and this creation is understood within a single organisational context. By pursuing this route with knowledge creation data collection has traditionally focused on events that created something dynamic after the event compared to conditions before the same event. When considering a business-to-business environment the forms of interaction leading to knowledge creation suggest that this would not occur through isolated events but through dynamic and complex processes of interaction overtime. For this reason knowledge creation is a dynamic process and not an event. To further research in this area it is important to ask what processes of knowledge creation

should we identify and how would they meet the a priori assumptions outlined at the beginning of this paper? Grover and Davenport (2001) provide a starting point in their call for a process framework focusing on the *'knowledge process and the context in which that process is embedded'* (p. 12) and having deliberate and emergent properties. Within the KM process framework the KM cycle (Awad & Ghaziri, 2004; Hislop, 2004) includes 'generation, codification, transfer and realisation' (Grover and Davenport 2001). Whereas this paper focuses on the first stage of 'creation' and the processes within this stage cannot be considered in isolation being dependent on what 'creation' actually means in a process context and in an inter-organisational context. The next concern is finding an appropriate theory that can describe processes of knowledge creation in a dyadic and or network context. In addition this paper aims to develop a broader perspective on what constitutes knowledge creation beyond the field of knowledge management.

Organisational Routines: Understanding Knowledge Creating Processes.

The discussion that knowledge creation must occur in a process or a system of some kind has also been confirmed in many different types of writings or literature/research threads (Nonaka, 1994; Van De Ven & Poole, 1995). It is thus necessary to consider what a 'process' is considered to be. The fields of systems thinking (Von Bertalanffy, 1972), processual analysis (Pettigrew, 1997; Van de Ven, 2007) and early literature on organisational routines (Nelson & Winter, 1982) focused on stable repeatable processes with defined measurable outcomes reflecting functionalist methods for data collection. Therefore how we describe processes has in itself an impact on data collection methods. The focus on processes within the network perspective finds its historical roots in systems thinking and processual analysis, which is one variant in process research identified by (Van de Ven, 1995; Van de Ven, 2007). These threads of research are supported by the literature on static organisational routines within a single organisation (Pentland, 2005). In contrast, the recent discussions of dynamic routines move away from an emphasis of structure and toward process emphasising agency with a routine's *'ability to remember the past, imagine the future, and respond to present circumstances'* (Feldman, 2003). Feldman notes that this context is ever changing with actions producing continuous outcomes. This suggests that the 'organisational routines' literature might provide a theoretical foundation that is appropriate for studying inter-organisational knowledge creating processes which are ever changing and are thus dynamic in nature. The appropriateness of organisational routines can be outlined in the following arguments;

Firstly, organisational routines have traditionally been seen as unchanging, static and closed (Nelson & Sidney, 1982). However recent developments suggest that routines are more complex than previously thought (Feldman, 2000; Feldman & Pentland, 2003) as we recognize their *'internal dynamic'*, and their *'potential for change'* (Feldman, 2000). Focusing on organisational routines is appropriate for the study of how knowledge is created as it reflects the research front of research regarding dynamic change i.e. change management, and the research in relation to processes. Feldman notes that the perspective on routines represents the focus that organising, as discussed in organisation theory, is now seen as a process rather than as a structure. This represents a shift toward seeing structure as process rather than a thing (Feldman, 2000 p613) mirroring the discussion above on knowledge creation being a process and not an event. Focusing on organisational routines is an apt way to understand knowledge creating processes in the context of dynamic change. By approaching this research topic with the assumption that the world is ever changing and dynamic there is the potential for a more realistic focus from a research perspective. According to Feldman (2000) other scholars have acknowledged this change relating to organisational routines referring to novel states of affairs. It should be noted that change in

itself is not the focus of this research paper but the context for organisational routines that alter in dynamic ways. This provides the 'lens' for research into processes of inter-organisational knowledge creation in a network.

A second reason for acknowledging organisational routines as appropriate for researching knowledge creation is that they can be seen, according to Feldman (2000), as *'producers of ideas'*. Feldman notes that *'one can think of routines as flows of connected ideas, actions, and outcomes. Ideas produce actions, actions produce outcomes, and outcomes produce new ideas'.* The reinforces the assertion that the focus on 'processes' in conjunction with the assumption that the environment is dynamic is a more appropriate 'lens' to understand knowledge creation.

In addition the reasons for considering organisational routines literature mirrors the thinking in Actor-Network Theory (ANT) where actors are seen to be both people and objects. The subjective perception of the processes these actors encounter is taken as the context for knowledge production. Whereas this paper refers to ANT it is the process of interaction within the routine that is emphasised more here. The perception of organisational routines is that they *'re-enact the past'*. Hence, (Orlikowski & Yates, 2002 p648) draw attention to the role of human actors '*in shaping the temporal contours of their lives, while also acknowledging the way in which people's actions are shaped by structural conditions outside their immediate control'*. Using this conceptualisation people involved in the inter-organisational routine are not separated from the routine itself making the routine, with the inclusion of human actors as a focus for data collection, a dynamically *'richer phenomenon'*. As can be seen here organisational routines mirroring ANT allow for multiple levels of analysis within its conceptualisation. The inclusion of human actors is argued as re-positioning research as being dynamic (Empson, 2001).

Ostensive and Performative Aspects of Organisational Routines

This research while focusing on the performative aspect of the inter-organisational routines the ostensive or structural aspect of the routine as perceived by the actors involved forms the foundation of the data collection. The understanding of both the performative and ostensive aspects of the routine is argued to be necessary to appreciate routines as a 'source of change' (Feldman & Pentland, 2003). '*Each part [of the routine] is necessary, but neither part alone is sufficient to explain (or even describe) the properties of the phenomenon we refer to as "organizational routines"'* (Feldman & Pentland, 2003). The ostensive aspect of a routine allows people to *'to guide, account for, and refer to specific performances of a routine'* (Feldman, 2000). This process of guiding, accounting and referring represents the dialogue between actors as they negotiate the recognizable pattern of actions, acknowledge the core actions for the routine. Actors are explaining to other actors what the norm of the routine is – as this dialogue unfolds this paper asks is knowledge creation occurring? The performative aspect of the routine *'creates, maintains and modifies the ostensive aspect of the routine'* (Feldman & Pentland, 2005). The change aspect of this would be closer to knowledge creation. The goal of people involved in a routine is not to create, maintain or modify but to achieve the goal of the routine – the creating, maintaining and modifying is an 'outcome of engaging in actions'. These affect the structure and effected by the structure that 'constrain and enable' further action. This represents the structure of the data being collected in this paper. For example as routines, in artifacts i.e. standard operating procedures, 'guide' actors toward potential action., the artifact can be relied on later to justify the action. The student actor can 'refer' to the SOP to 'account' for his/her decision to act.

The Dominant Theory of Knowledge Creation

The dominant theory of knowledge creation or SECI Model was presented (Nonaka, 1994; Nonaka & Takeuchi, 1995) as a form of interaction between tacit and explicit knowledge (the epistemological dimension) and the interaction between individuals and the organisation (the ontological dimension). The SECI model makes the assumption that knowledge is created through a spiral or pattern of interaction involving these two dimensions. The relationship between tacit and explicit is illustrated under four modes of knowledge conversion from socialisation, through a process of externalisation, combination and internalisation as illustrated in Figure 1.

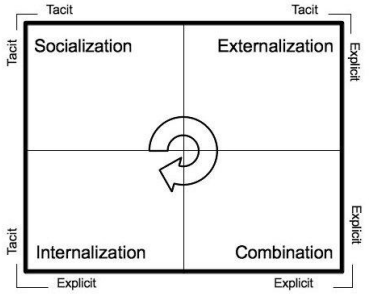

Figure 1: The SECI Model: Source Nonaka (1994).

According to Nonaka and Takeuchi (1995) four knowledge conversion processes form the cornerstone of creating new organisational knowledge;

1. **Socialisation (tacit to tacit):** Through shared experiences there is tacit to tacit knowledge conversion process achieved through observation, imitation and people interacting so as to learn vicariously each others' cognitive processes. This usually starts with the building of a team or on-the-job training a 'field' of interaction referred to as 'ba' in a later paper (Nonaka & Konno, 1998).
2. **Externalisation (tacit to explicit):** Through a process of articulation tacit knowledge can be converted to explicit knowledge. This is triggered by rounds of 'dialogue' and the use of 'metaphors' allowing people to articulate their perspectives playing a significant part in this mode of knowledge conversion.
3. **Combination (explicit to explicit):** Individuals, and organisations, systematise concepts into a knowledge systems combining explicit knowledge with previously held explicit knowledge. This is achieved through social processes such as meetings and telephone conversations. Computer systems provide an example of this as organisational information gets re-arranged, re-categorised and reconfigured. Concepts formed by teams can be combined with existing data in a search for shared specifications through 'co-ordination' between team members and other sections of the organisation through documentation of existing knowledge such as standard operating procedures (SOPs). This combination leads to future action.
4. **Internalisation (explicit to tacit):** Through a process of embodying explicit knowledge with internal tacit knowledge traditional understanding becomes what we understand as learning. 'Action' is deeply related to this internalisation process as discussed in the field of organisational learning.

One main criticism of the SECI Model is that 'creation' might well be the accumulation of a series of discrete events of knowledge conversion. Arguably this theory of knowledge creation doesn't view knowledge as being defined as 'something from nothing' but could be critiqued as being akin to just 'knowledge transfer' i.e. modes of conversion. This by proxy re-phrases the discussion of creation in the main areas of research in the field of knowledge management i.e. knowledge transfer; a different part of the KM cycle. On the other hand by grouping these discrete conversion events a process can be understood to exist as the modes

of conversion and two dimensions discussed above come into play. Much of the research operationalising the SECI Model has tended to treat the modes of conversion as discrete measurable variables (Chou & Wang, 2003; Chou & He, 2004). A philosophical discussion more suited to the methodological section of this paper may well inform this difference with each event being researched in absence of understanding the wider process in which it contributes to. A second criticism is that there is an inbuilt assumption that tacit knowledge can successfully be converted into explicit knowledge (Tsoukas, 2009). Nonaka (1994) recognises that '*the assumption that knowledge is created through conversion between tacit and explicit knowledge allows us to postulate four different 'modes' of knowledge conversion'* (p18). Again these modes suggest events rather than processes. The third issue is that the SECI Model represents a 'dynamic' theory (Nonaka, 1994) as the paper *'proposes a paradigm for managing the dynamic aspects of organisational knowledge creating processes'.* Is might be worth questioning as to how 'dynamic' this theory is as it arguably follows the linearity so often found in typical approaches to knowledge management. This requires further investigation.

Alternative Theories of Knowledge Creation

At the beginning of this paper the modal theory of knowledge production was outlined (Gibbons et al., 1994). Successful knowledge creation was seen within society as being a function of the relationship of theory and practice (Nowotny et al., 2001; Van De Ven & E., 2006) and that continued production of knowledge would be dependent on knowledge being produced in an inter-organisational context such as the university-industry context requiring business schools to reassess their role and agenda (Huff, 2000; Huff & Huff, 2001). Knowledge production would most fruitfully occur in a practice based environment, referred to as Mode 2 knowledge production, but with the embedded partnership of academe. It is this inter-organisational theory of knowledge creation that has informed the context for this study. In addition to modal theory of knowledge production this theory which contributes significantly to industrial, educational and entrepreneurial policies there are many other identified theories, beyond the field of knowledge management, that contribute to our understand of knowledge creation. Underpinning this modal theory is a communications based theory referred to by Gibbons et al (1994) as the model of increasing density of communication. This focuses on heterogeneous growth that is exhibited by science and technology systems exhibited on three levels of communication. These levels are said to be the level of communication between science and society, communication between scientific practitioners and 'metaphorically speaking', communication with entities of the physical and social world' (Gibbons et al 1994 p18). This provides a foundation to inform data collection in across different levels from macro levels where communication between science and society for example is occurring at a policy level it informs a need to collect data at this communicative level to supplement data collection at an individual level or between scientific practitioners and artifacts.

According to Nonaka (1994) theories of organisational learning have ignored the concept of externalisation as used in the SECI model, while at the same time they have paid little attention to 'socialisation' even though there is a body of research on 'modelling behaviour' in Learning Psychology. There are other theories of knowledge creation within the field of Organisational Learning which need to be highlighted. The first kind of learning is obtaining knowledge in order to solve specific problems based upon existing premises. The second kind of learning is establishing new premises (paradigms, schemata, mental models or perspectives) to override existing ones. These two types of learning are referred to as Learning I and Learning II. Bateson (1973) emphasises single loop learning while Argyris and Schön (1978) develop upon this as they emphasise double loop learning. The interaction

between single loop and double loop learning is seen as a core part of the SECI model (Nonaka & Takeuchi, 1995 p. 44).

Senge (1990) proposed and argued that the 'learning organisation' has the capacity for both generative learning (i.e., active) and adaptive learning (i.e., passive) as the sustainable source of competitive advantage. Here we can see a clear attempt to marry both schools of thought under the umbrella of the learning organisation. There are five things that are recommended to build a learning organisation;

1. Adopt 'systems thinking' – this supported the assertions in this paper.
2. Encourage 'personal mastery' of their own lives – this supports the inclusion of human actors.
3. Bring prevailing 'mental models' to the surface and challenge them.
4. Build 'a shared vision'.
5. Facilitate 'team learning'.

Most of the theories here are criticised for being 'trapped in a behavioural concept of 'stimulus-response' as might be seen in Simon's information processing paradigm (Simon, 1973) and Andersen's architecture of cognition model from cognitive psychology (Anderson, 1983). While there are many other theories from different fields of research a more in-depth discussion is outside the scope of this paper. However there are obvious similarities across all theories of knowledge creation on the basis of some form of duality or dualism (Farjoun, 2010) that occurs between two entities that is assumed to be the basis of knowledge creation.

A Dialogical Theory of Knowledge Creation

In the field of creativity and organisational learning a dialogical theory for creating organisational knowledge is outlined (Tsoukas, 2009). Tsoukas asks *'what are the generative mechanisms through which new organizational knowledge is created?'* He notes that the concept of 'interaction', or as is mentioned later in his paper *'social interaction'*, has been identified by previous studies of organisational knowledge as the *'bedrock'* for knowledge exchange practices. The question now is what is in interaction that gives rise to new organisational knowledge or in what particular form should 'interaction' take? This research, while focusing primarily on the subjectively identified routines by actors within organisational and inter-organisational routines considers the nature of how the actors interact dialogically within and across these routines. This paper conceptually argues that a dialogical analysis within inter-organisational routines forms the bedrock of all available theories of knowledge creation. Previous existing theories of knowledge creation are all have a common characteristic; there is a dialogue between two entities that result in an outcome that is deemed to represent knowledge creation in itself. This assertion is supported by Nonaka's SECI Model which assumes '*knowledge is created through conversion between tacit and explicit knowledge'* illustrating this interaction or dialogue between explicit and tacit knowledge. The indeed is one area of agreement between Tsoukas's dialogical theory of knowledge creation and Nonaka's SECI model. When considering this from the individual perspective there needs to be intentionality, autonomy and fluctuation with the outside world. As *'knowledge creation at the individual level involves continuous interaction with the external world'* (Nonaka, 1994). These fluctuations can lead to breakdowns or contradictions where individuals question individual habits. This can also be seen from a dialogical perspective as outlined in Tsoukas' paper. *'The essence of dialogicality is sensitivity to otherness'* (Tsoukas, 2009). This is the 'realization that the categories we think and communicate with are no more individual creations but dialogically constituted through communication with others' (p161). The author continues by saying that *'dialogicality is at the heart of interaction and is the basis for making new distinctions and, hence, developing new knowledge'*. New knowledge in organisations stems from the exercise of human

judgement; the ability of the individual to be able to draw new distinctions; typically in a team setting. There are three forms of dialogical and quasi-dialogical exchanges individuals may engage in: dialogical exchanges with real others, quasi-dialogical exchanges with imaginal others, and quasi-dialogical exchanges with artifacts.

Dialogical exchanges with real others
This is a face to face dialogue with two individuals or 'real others'. As the structure of the conversation unfolds new distinctions emerge. These emerge in diverse contexts such as detective work, nursing, medical diagnoses and educational practice.

Quasi-dialogical exchanges with imaginal others
Individuals are never really alone, they find themselves talking arguing and responding to others, such as critics, friends, gods, their own consciousness, photographs, figures in their dreams or in the media. The imaginal other is within us, or authors in a dialogue with reviewers when revising a manuscript. In an organisational context the most theoretically salient imaginal other is the 'generalised other' such as 'the employer' or 'the profession'. Human actors go through three stages, the 'play stage' where other's outer appearances are imitated without seeing the world from their perspective, then secondly the 'game stage' where the actors adopts attitudes and learns to see the world from a different perspective. Finally in the 'generalised other' stage actors having learned the roles of the others grasp the relationships and further learn to adopt the attitude of the whole community or social group of which they become apart.

Quasi-dialogical exchanges with artifacts
The artifacts that actors create in the course of their work are called 'reference entities' or 'epistemic objectives'. This provides some promise for looking at 'concrete practices' as referred to in the communities of practice (COP) literature (Brown & Duguid, 1991; Duguid, 2005). Tsoukas says that what is characteristic of them is their ambivalent ontological status as knowledge carriers, are stable and mutable, and they incorporate given knowledge and manifest knowledge. Epistemic objects are repositories of what actors focally know so far, hence they are stable, but they also incorporate knowledge of which the actors are not focally aware of, hence they are open for further development so they serve at once as 'a materialised log of the making process' (p167). As mutable objects they are inherently incomplete, thus being able for further development. Epistemic objects and their importance to knowledge creation has been pointed out by many researchers. The use of prototypes and models to help companies innovate is particularly important. These often show things that cannot be verbalised and thus can lead to richer conversations. These three dialogues leading to new distinctions directly impact on the appropriate data that will be focuses on in this paper. These dialogues occurring within inter-organisational routines reflect the key focus of data collection. By arriving at new distinctions the actors can be seen to generate knowledge within subjectively identified routines. This dialogical theory is grounded in the organisational learning field but there are clear similarities with the model of increasing density of communication discussed above which provides evidence supporting a dialogical theory of knowledge creation mirroring dialogue at different levels. This dialogical theory is also grounded in studies on creativity, entrepreneurship and innovation which all reflect dualities (Farjoun, 2010) underpinning creation. Cognitive psychology and theories of education and learning also appear to contribute to a dialogical theory of knowledge creation. Tsoukas states *'A dialogical perspective opens up new areas of research in order to further advance our understanding of the processes through which new knowledge in organisations is created'* (p172). This dialogical approach is support by multiple fields of research going

back as far as the Socratic method in the study of Epistemology right up the hegemonic field of research lead by Nonaka.

METHDOLOGY

Introduction

There are a number of considerations that inform the methodology relating to studying inter-organisational knowledge creating routines. Knowledge creation must be studied on a multi-levelled perspective so as to gain a full understanding of the inter-organisational routines and a full understanding of the dynamic environment. Data collection must be collected where possible from different levels of analysis from individual to societal. In addition data collected must reflect actors' subjective perception of the routines and sub-routines they perceive they are interact within. Inter-organisational knowledge creating routines involve the interaction of two actors (human and non-human) through a dialogical process. The next section highlights the broad problematic with more specific research objectives that lead into specific objectives for data collection.

Research Problematic

How can organisations through their interaction create knowledge?
What inter-organisational processes or routines can be identified that result in knowledge creation?
In identifying inter-organisational routines what role does dialogue likely play within these routines to create knowledge?
How can inter-organisational knowledge creating routines be managed so that organisations who interact do so in a manner that creates knowledge?

Research Objectives

How can the inter-organisational routine be improved to ensure that the outcome of the routine leads to knowledge creation?
Within inter-organisational routines what generative mechanisms can influence action and interaction?
How can dialogical interactions be identified within the inter-organisational routines so as to uncover generative mechanisms?

Data Collection Objectives

To analyse how different forms of dialogue can reveal processes of knowledge creation.
To analyse how dialogue within actor identified sub-routines contribute to the generative nature of the overall inter-organisational routine.
To analyse how subjectively identified sub-routines reflect the overall perception actors have of the inter-organisational routine.

Data Collection: Dialogue within Ostensive & Performative Aspects of the Routine.

As a basis of laying the foundation for a '*general theoretical account of how new organisational knowledge is created'* (Tsoukas, 2009 p.160) it's important to identify processes, or in this case inter-organisational routines, that contain what Tsoukas calls 'generative mechanisms'. This objective is aimed at revealing potential mechanisms, within the confines of the assumptions outlined at the beginning of this paper, that lead to action and interaction. It should be noted that these process related generative mechanisms are identified in inter-organisational routines involving social interaction of actors and non-human actors. This leads itself into the last objective. Through dialogical interactions between three actors, 'real others', 'imaginal others' and 'artifacts' (Tsoukas, 2009) actors can guide their

behaviour, account for their actions, refer to patterns of activity. As noted above the ostensive and performative aspects of the organisational routine provides the dynamic context in which dialogue can occur. Thus through repetition and recognition within routines actors can maintain or modify the ostensive elements of the routines they engage with (Feldman, 2000; Feldman & Rafaeli, 2002). This is the lens used to reveal generative mechanisms within the context of inter-organisational routines across a network of actors. Feldman (2000) provides a detailed framework for data collection in the context of identifiable routines. Her paper discusses college housing routines and the stages outlined have been relied on here as a basis of structuring data analysis. The following broad stages of collection and analysis were followed.

Stage 1: Internal organisational routines (in both organisations) and inter-organisational routines, as subjectively identified by actors are focused on for coding purposes. This provides the context for the actors as they progress from play through gaming to generalised actor stages (Tsoukas, 2009)

Stage 2: Within the context of identified routines 'actors' (both human and non-human) were identified. Artifacts (documentary evidence and artifacts identified by human actors) were considered for the purposes of understanding 'dialogue in action'.

Stage 3: Dialogical examples, representing routines at differently levels of analysis, between actors were then analysed as the basis of interaction. Tsoukas (2009) provides an outline for analysing available dialogical data discussing three types of actors engaged in performative dialogue This typology is drawn upon as a starting point for organising the data;

- **Real Others** – considers human to human actor dialogues;
- **Imaginal Other** – dialogues actors have with 'the organisation', 'the employer' or 'the profession' are considered.
- **Artifacts** – dialogues with epistemic artifacts resulting in action including 'job specs' and training manuals which potentially 'guide' and 'maintain' actor behaviour 'accounting' for action (Feldman & Pentland, 2003).

Stage 4: Consolidation of Potential Dialogues – Given the simple framework for our analysis, there are nine potential 'dialogues' of which the 'real other' to 'real other' dialogue is arguable the most important across different levels of analysis. These are nine core 'dialogues' will form the basis of understanding business-to-business knowledge creation in the university-industry context.

Embedded Nature of this Research

As an embedded researcher ongoing in-depth interviews are conducted with all three actor groups assessing their lived experience of the internship routine. Student actors will also complete reflective logbooks outlining their experiences of the whole internship/placement routine. Additional data will be collected through LinkedIn.com a professional social network site. In-depth interviews will focus on both employers directly responsible for interns and employers who manage the internship routine. Documentary evidence including internship quality assurance forms will provide evidence on dialogue within routines. As an embedded researcher academic and institutional data takes the form of unstructured meetings, informal conversations and anecdotal hallway comments. Direct observation in internship/placement preparation classes is also an important source of dialogical data.

Data is collected at the individual micro-actant and macro-actor inter-organisational levels with actors involved and related to the internship/placement inter-organisational routine. The researcher was embedded with the Links/Placement service and altered his role from non-participant observer, to participant observer to active researcher throughout the data collection process. Where appropriate snowball sampling was used to identify additional

actors. Employers were pre-selected due to the numbers of student actors who gained employment through the placement service or from their own initiative. The Links/Placements Routine managed by the an 'institutional actor' at an Irish third level institution.. This increased the opportunity to reveal internal organisational routines. For the purposes of clarifying the focus of data collection the three actors are illustrated alongside their potential dialogues in Figure 2.

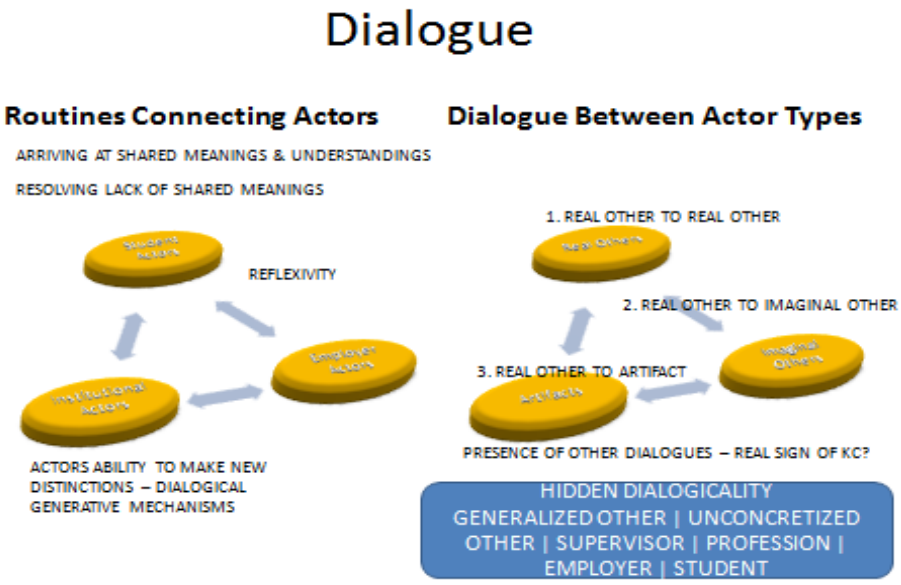

Figure 2: Dialogue within Routines Connecting Actors

Student Actor Data: Onsite and follow-up interviews were conducted with student actors in relation to their experiences with the employer organisation, employer actors throughout the internship/placement routine as they lived it. Further clarifications of routines and processes they encountered were sought as suggested by Stage 1 above. With the view of seeking out multiple sources of data, student actors were tasked with completing reflective logbooks and separate reflective projects. This was used as a basis for analysing their role in and perceptions of various organisational and inter-organisational routines in their micro-actant roles.

Employer Actor Data: Interviews were conducted with employer actors directly responsible for managing student actors on site. Further documentary evidence including Internship Assessment Forms with open ended questions directed at employer actors were also used. These provided additional evidence as to how organisational and inter-organisational routines contributed to knowledge exchange practices with student actors. Macro-employer actors were also focused on to gain an understanding of the inter-organisational routine as micro-employer actors engaging with student actors could rarely provide any insight.

Institutional Actor Data: The Internship Manager, Academic Manager, Academic Mentors, Careers Service and Internship Quality Assurance Officers linked with the internship/placement inter-organisational routine were interviewed. As an embedded researcher this data took on many forms including unstructured meetings, informal conversations including anecdotal hallway comments. Extensive field notes were recorded. In additional 'Internship Classes' were conducted between the Internship Officer and Student Actors which revealed dialogues and an understanding of the macro-routines lived by the actors involved. This 'class' was also relevant for understanding the inter-organisational aspect between employers and institutional actors. This was recorded as a non-participant

direct observer. By way of clarification the close relationship between main employer actors and the internship manager was also a factor in selecting this context so that inter-organisational routines could be discussed at a macro-actor level. In addition these 'classes' revealed dynamics within the relationship between the internship service and student actors.

Artifactual Data & Documentary Evidence: As noted above documentary evidence linked to student actors was heavily relied on. Desk research documents from employers and supporting published material and industry reports on the internship industry were also used revealing trend analysis of the internship or internship industry in Ireland. It should be noted at this stage that individual 'actant' as well as macro-organisational 'actor' interactions were highlighted ensuring that a multi-level analysis could be supported. The use of constructs of actant and actor is linked to achieving a multi-levelled analysis as discussed above.

RESEARCH FINDINGS

Using the structure of data analysis outlined above the preliminary findings the first stage was to identifying how the actors themselves identified the routines they were experiencing.

Identifying Routines to Understand Dialogue in Action (Stage 1 & 2).

By identifying inter-organisational processes that might yield knowledge creation we can use the routines literature as the basis of commencing this discussion. This will have important implications for the type of routines that will be identified. Feldman (2000) observed routines that were repeated on an annual basis within a college housing context. Actors' perceptions of the internship routine raised some issues relating to temporal organising (Orlikowski & Yates, 2002). Each actor in the case study has a different perception of the inter-organisational routine and this was reflected in how they discussed time. As each actor is not autonomous, through dialogue within routines, actors arrived a negotiated understanding as supported by Tsoukas' theory of knowledge creation. The institutional actor's behaviour is influenced and guided by the year-long academic calendar with overlapping activities. This calendar or artifact guides behaviour, determines when action should be taken and/or repeated to meet the placement routine's goal. Student actors are also influenced by the academic calendar but in contrast they don't see the internship/placement routine in a kairotic annual context in their exchange with institutional and employer actors. Micro-employer actor, in this context, appear to be influenced primarily from the interviewing aspect of the routine to departure of the student. Their perception of the internship routine is even shorter than that perception held by macro-actor employers and student actors. Three themes of negotiated temporal organising were arrived at from the data collected.

Toward Consolidating Potential Dialogues (Stage 3 & 4).

The data collected focus on the core forms of dialogue between both human and non-human actors across different levels of analysis. The following section focuses on just three of the dialogues with potential for revealing knowledge creation within routines;

1. **Internship Classes illustrating Imaginal Others:** The internship classes provided some insight into two dialogues; the internship officer to macro-employer actor dialogue. At this stage this employer actor is an 'imaginal other' as it highlights what the stereotypical employer would want from the stereotypical student, also an imaginal other. From a first level of analysis it is clear that the actors interviewed simultaneously switch between individuals as micro-actants and organisations as macro-actors. It is within these dialogical contexts that evidence of organising can be found. Each dialogue reveals how actors perceive stages of the placement inter-organisational routine and/or internal organisational sub-routines. As noted the internship officer's temporal perception was more kairotic as actions today were seen as having an effect in the subsequent internship

cycle i.e. the actions of a student actor in an interview or on internship would impact on the future availability of internship places. Student actors presented chronological temporal structuring as the internship routine was experienced once. Thus each routine reveals a temporal structure which requires further study.

2. **Interviews with Student Actors illustrating Imaginal Others:** Student actor interprets the needs of the stereotypical 'employer actor' as an imaginal other. Student on-site interviews illustrated their perceptions of what 'the organisation' might think of their actions within the internal organisational sub-routines. Not only were they dealing with their immediate superiors in the course of their daily work they also verbalised their relationship with 'the employer' and/or 'the organisation' as an 'imaginal other'. Within the accountancy based employers the imaginal other 'the accountancy profession' was revealed.
3. **Dialogues with Artifacts:** Actors engaged with artifacts required student actor to act within a time frame. On-site interviews revealed how artifacts guided action and allowed actors to account for their behaviour. Standard operating procedures, CV's, Employer briefs and job specification artifacts could be linked directly with specific forms of student actor behaviours. The institutional internship actor relied heavily on reports, artifacts and industry documents to account for changes to how the placement routine was managed and explain performative actions in the internship routine. Perceptions of time or temporal structuring as an artifact and imaginal other requires additional study.

CONCLUSION

The development of new business-to-business knowledge has been called for by many of the theorists from disparate fields of study including knowledge management, innovation and creativity and economics. In addition there's a greater gap in the literature in relation to how organisations through their interaction with other organisations create knowledge. Tsoukas (2009) claims that "*there is still no satisfactory answer to the question, 'what are the generative mechanisms through which new organizational knowledge is created?'"* The application and operationalisation of the Organisational Routines literature in the business-to-business context will provide fresh insights developing processual analysis in a dynamic context (Zollo & Winter, 2002). Natural extensions of this research will help us understand the operation in the marketplace of university-industry patenting processes (Agrawal, 2002; Agrawal & Henderson, 2002) incubation centre research in innovation and entrepreneurship (Etzkowitz, 1998). The output of this research will contribute to providing empirical evidence for innovation and industrial policy (Gibbons et al., 1994; Nowotny et al., 2001). Educational policy pertinent to the agenda of business schools (Huff, 2000; Huff & Huff, 2001) including implication for the development of workplace dialogue a topic in the field of organizational psychology and industrial relations.

REFERENCES

Agrawal, A. 2002. Innovation, growth theory, and the role of knowledge spillovers. ***Innovation Analysis Bulletin***, 4(3): 3-6.

Agrawal, A., & Henderson, R. 2002. Putting Patents in Context: Exploring Knowledge Transfer from MIT. ***Management Science***, 48(1): 44-60.

Anderson, J. R. 1983. ***The Architecture of Cognition***: Cambridge, MA: Harvard University Press.

Argyris, C., & Schön, D. A. 1978. ***Organizational Learning: A Theory of Action Perspective***: Addison-Wesley Reading, MA.

Awad, E. M., & Ghaziri, H. M. 2004. ***Knowledge Management*** (International ed.). New Jersey: Prentice Hall.

Bateson, G. 1973. ***Steps Toward an Ecology of Mind***. London: Paladin.

Brown, J. S., & Duguid, P. 1991. Organizational Learning and Communties-of-Practice: : Toward a Unified View of Working, Learning and Innovating. ***Organization Science***, 2(1): 40-57.

Burrell, G., & Morgan, G. 1979. ***Sociological Paradigms and Organization Analysis***. Aldershot, Hampshire: Ashgate Publishing Ltd.

Chou, S.-W., & Wang, S.-J. 2003. Quantifying `ba': An Investigation of the Variables that are Pertinent to Knowledge Creation. ***Journal of Information Science***, 29(3): 167-180.

Chou, S. W., & He, M. Y. 2004. Knowledge management: the distinctive roles of knowledge assets in facilitating knowledge creation. ***Journal of Information Science***, 30(2): 146.

Cockburn, I. M., & Henderson, R. M. 1998. Absorptive Capacity, Coauthoring Behavior, and the Organization of research in Drug Discovery. ***Journal of Industrial Economics***, 46(2): 157-182.

Cohen, W. M., & Levinthal, D. A. 1990. Absorptive Capacity: A New Perspective on Learning and Innovation. ***Administrative Science Quarterly***, 35(1): 128-152.

Duguid, P. 2005. 'The Art of Knowing': Social and Tacit Dimensions of Knowledge and the Limits of the Community of Practice. ***Information Society***, 21(2): 109-118.

Easterby-Smith, M., Graca, M., Antonacopoulou, E., & Ferdinand, J. 2008. Absorptive Capacity: A Process Perspective. ***Management Learning***, 39(5): 483-501.

Empson, L. 2001. Fear of exploitation and fear of contamination: Impediments to knowledge transfer in mergers between professional service firms. ***Human Relations***, 54(7): 839-862.

Etzkowitz, H. 1998. The norms of entrepreneural science: cognitive effects of the new university-industry linkages. ***Research Policy***, 27(8): 823.

Farjoun, M. 2010. Beyond Dulaism: Stability and Chage as a Duality. ***Academy of Management Review***, 35(2): 202-225.

Feldman, M., & Pentland, B. 2005. Organizational Routines and the Macro-Actor. In C. B., & H. T. (Eds.), ***Actor-Network Theory and Organizing***: Liber & Copenhagen Business School Press.

Feldman, M. S. 2000. Organizational Routines as a Source of Continuous Change. ***Organization Science***, 11(6): 611-629.

Feldman, M. S., & Pentland, B. T. 2003. Reconceptualizing Organizational Routines as a Source of Flexibility and Change. ***Administrative Science Quarterly***, 48(1): 94-118.

Feldman, M. S., & Rafaeli, A. 2002. Organizational Routines as Sources of Connections and Understandings. ***Journal of Management Studies***, 39(3): 309-331.

Ford, D., & Håkansson, H. 2006. The idea of business interaction. IMP Journal, 1(1): 4-20.

Gibbons, M., C., L., Nowotny, H., S., S., P., S., & M., T. 1994. ***The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies***. London: Sage Publications.

Grover, V., & Davenport, T. H. 2001. General Perspectives on Knowledge Management: Fostering a Research Agenda. ***Journal of Management Information Systems***, 18(1): 5-21.

Håkansson, H., & Ford, D. 2002. How should companies interact in business networks? ***Journal of Business Research***, 55(2): 133-139.

Håkansson, H., & Snehota, I. 1989. No business is an island: The network concept of business strategy. ***Scandinavian Journal of Management***, 5(3): 187-200.

Hislop, D. 2004. Knowledge management in organizations: A critical introduction.

Huff, A. S. 2000. 1999 Presidential Address: Changes in Organizational Knowledge Production. ***Academy of Management Review***, 25(2): 288-293.

Huff, A. S., & Huff, J. O. 2001. Re-Focusing the Business School Agenda. ***British Journal of Management***, 12: S49.

Kaufmann, G., & Runco, M. A. 2009. Knowledge management and the management of creativity In T. Rickards, M. A. Runco, & S. Moger (Eds.), ***The Routledge Companion to Creativity***. London and New York: Routledge.

Kuhn, T. S. 1962. ***The Structure of Scientific Revolutions***. Chicago.

Malhotra, Y. 2003. Is knowledge the ultimate competitive advantage. ***Bussiness Management Asia***, 9: 66-69.

Nelson, R. R., & Sidney, G. W. 1982. ***An Evolutionary Theory of Economic Change B2 - An Evolutionary Theory of Economic Change***. Cambridge, MA: Harvard University Press.

Nelson, R. R., & Winter, S. G. 1982. ***An Evolutionary Theory of Economic Change***: Harvard University Press.

Nonaka, I. 1991. The Knowledge-Creating Company. ***Harvard Business Review***, 69(6): 96-104.

Nonaka, I. 1994. A Dynamic Theory of Organizational Knowledge Creation. ***Organization Science***, 5(1): 14.

Nonaka, I., & Konno, N. 1998. The Concept of `Ba': Building a Foundation for Knowledge Creation. ***California Management Review***, 40(3): 40-54.

Nonaka, I., & Nishiguchi, T. 2001. ***Knowledge Emergence: Social, Technical, and Evolutionary Dimensions of Knowledge Creation***: Oxford University Press, USA.

Nonaka, I., & Takeuchi, H. 1995. ***The Knowledge-Creating Company: How Japanese companies create the dynamics of innovation***: Oxford University Press US.

Nonaka, I., & Teece, D. J. 2001. ***Managing Industrial Knowledge: Creation, Transfer and Utilization***: Sage Publications.

Nonaka, I., Toyama, R., & Konno, N. 2000. SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation. ***Long Range Planning***, 33(1): 5-34.

Nowotny, H., Scott, P., & Gibbons, M. 2001. ***Re-thinking Science: Knowledge and the Public in an Age of Uncertainty***: Polity.

Orlikowski, W. J., & Yates, J. 2002. It's About Time: Temporal Structuring in Organizations. ***Organization Science***, 13(6): 684-700.

Pettigrew, A. M. 1997. What is a processual analysis? ***Scandinavian Journal of Management***, 13(4): 337-348.

Prahalad, C. K., & Hamel, G. 1990. The Core Competence of the Corporation. ***Harvard Business Review***, 68(3): 79-91.

Senge, P. M. 1990. ***The Fifth Discipline: The Art and Practice of the Learning Organization*** (1st ed.). New York: Doubleday/Currency.

Simon, H. A. 1973. Applying Information Technology to Organization Design. ***Public Administration Review***, 33(3): 268-278.

Stalk, G., Evans, P., & Shulman, L. E. 1992. Competing on capabilities: The new rules of corporate strategy. ***Harvard Business Review***, 70(2): 54-66.

Tsoukas, H. 2009. Creating organizational knowledge dialogically: an outline of a theory. In R. T., R. M.A., & M. S. (Eds.), ***The Routledge Companion to Creativity***. London and New York: Routledge.

Tsoukas, H., & Mylonopoulos, N. 2004. Introduction: Knowledge Construction and Creation in Organizations. ***British Journal of Management***, 15: 1-S8.

Van de Ven, A. H. 2007. ***Engaged scholarship: A guide for organizational and research knowledge***: New York: Oxford University press.

Van De Ven, A. H., & E., J. P. 2006. Knowledge for Theory and Practice. ***Academy of Management Review***, 31(4): 802-821.

Van De Ven, A. H., & Poole, M. S. 1995. Explaining Development and Change in Organizations. ***Academy of Management Review***, 20(3): 510-540.

Von Bertalanffy, L. 1972. The history and status of general systems theory. ***The Academy of Management Journal***, 15(4): 407-426.

von Krogh, G., Ichijo, K., & Nonaka, I. 2000. ***Enabling Knowledge Creation: How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation***: Oxford University Press, USA.

von Krogh, G., Nonaka, I., & Nishiguchi, T. 2000. ***Knowledge Creation: A Source of Value***: Palgrave Macmillan.

Zollo, M., & Winter, S. G. 2002. Deliberate Learning and the Evolution of Dynamic Capabilities. ***Organization Science***, 13(3): 339-351.